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SCIENTIFIC AND LITERARY REVIEW,

A RECORD OF PROGRESS IN ARTS, INDUSTRY, AND MANUFACTURES,

INCORPORATING THE

Journal of the Inventors' Institute.

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VOL. XV.—No. 4.] APRIL 6, 1880. [PRICE 6d.

[THIRD SERIES.]

⁂ *Communications to the Editor to be addressed to him at 21, Cockspur Street.*

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Ships' Cargoes (Loading, &c.)—Sir J. Coode.

Ships (Raising).—W. R. Mowbray and E. Murley.

Shirts, &c.—B. Mills (com.)

Sifting, Sorting, and Separating.—W. R. Lake (com.), F. Wirth (com.), W. R. Lake (com.), J. Griffiths.

Signals, Alarms, Communicating Apparatus, Conveying Sounds.—W. Smith, H. Morris, G. Edwards, S. A. Say, J. C. Mewburn (com.), T. Barrow, W. King, P. Black, C. E. Spagnoletti.

Soundings.—Sir W. Thomson.

Sounds (Producing, &c.)—R. H. Courtenay.

Sowing Seeds.—J. Scott.

Spindles, &c.—W. S. Taylor, J. Booth.

Spinning and Preparing for Spinning.—J. Walsh and J. Farran, T. Coltman, I. Bailey, G. Tempest, E. Riley, W. & S. Taylor, J. Hendry (com.), J. Pollard, J. & J. A. Marsh, B. A. Dobson,

Springs.—W. E. Wiley, E. Horsepool, L. Sterne and J. B. Handyside, W. Fleet, H. Smith, J. Hinks and T. Hooper.

Stamps (revenue), &c.—H. Palm, J. R. Robinson, F. F. Bond.

Starch.—E. Edmonds (com.), T. Lancaster.

Stays.—W. P. Thompson (com.)

Steam and other Boilers, Cleaning and Preventing Incrustation of Boilers, Water Feeding Apparatus for Boilers.—R. Skene, T. Nutt, L. Varicas (com.), G. W. Garrett, F. J. Brougham (com.), J. W. Cook, E. H. McNielH. J. Haddan (com.). W. Clark and W. M. Swanson.

Steam Engines (Stationary, Locomotive, and Marine).—F. W. Durham, J. Mitchell, C. Brown, J. Ramsbottom, G. Cranstown, S. W. Wilkinson, T. Presten and J. B. Hammond.

Stone, &c.—W. L. Wise (com.)

Sugar and Syrups Glucose.—W. Morgan-Brown (com.), W. Spencer (com.), F. G Harvey.

Surgery.—F. Wirth (com.), W. H. Beach.

Teaching, &c.—J. Stevens.

Telegraphs; Telegraph Printing Apparatus.—J. H. Johnson (com.), W. C. Johnson and S. E. Phillips, W. Morgan-Brown (com.), J. C. L. Loeffler, R. H. Courtnay, F. H. W. Higgins, R. H. Courtenay, J. T. King (com.)

Testing Liquids, &c.—J. Aitken, W. P. Thomp- (com.)

Thermometers, &c.—J. W. Zambra.

Threads and Yarns.—W. A. Barlow (com.)

Tilling and Cultivating, &c.—R. P. Parsons, B. Smith.

Tobacco and Snuff, Cigars, Cigar-Holders, Pipe and Cigar-lighters, Smoking Pipes, Tobacco Pouches, &c.—W. B. Haas, R. Gottheil (com.)

Tools.—J. Angus, J. Walker.

Tramways and Tramway Carriages, Tramway, Locomotives.—W. C. Hamersham, J. Truswell, C. Wheeler. J. Davidson.

Umbrellas, Parasols, &c.—A. C. Henderson (com.), A. M. Clark (com.), S. Kott.

Upholstery.—W. E. Gedge (com.), W. H. Richards and H. Sfierrett, J. W. Cousins, H. Smith.

Valves, Taps, Stop Cocks, Plugs; Regulating the Flow and Pressure of Fluids.—W. Ross, D. R Ashton, A. H. Vernon, T. Adams, C. J. Waddell, R. Smith, F. W. Durham, A. Gascoigne, J. W, Cull and J. R. Fenby, C. C. Barton, J. Ramsbotham, R. Schomburg (com.), P. Hames, W. Wilson, G. Cranstown.

Velocipedes, Bicycles, &c.—W. Hillman, F. Allrock, B. Williams and D. Lougher, C. Wicksteed, A. T. Burton, T. Sparrow, A. Jennings, N. Salomon, T. M. Gubbin and J. Mangnell.

Ventilation: Supplying and Purifying Air for Buildings, Mines, Ships, Carriages, &c.—B. J. B. Mills (com.), H. Johnson. T. Sutherat, C. T. Mazzetti, A. Hancock and H. S. Heath.

Washing, Cleansing, and Wringing Fabrics, Yarns, and Materials.—E. Taylor, J. Cherk, J. Wilding. W. T. Brown, W. R. Lake (com.)

Water-Closets, &c.—W. Ross, R. Smith, J. H. Johnson (com.), G. de Pass (com.)

Water-power Engines, &c.—E. Wigzell and J. Bollit.

Waterproofing, &c.—J. Swallow.

Wearing Apparel, &c.—W. H. Richards and H, Skerrett, G. Green.

Weaving, Braiding, Plaiting, Preparing for Weaving.—D. Marcon and G. S. Knott, E. Hollingworth, T. Blackhurst, J. Imray (com.), C. Cross, A. C. Henderson (com.), G. Garstang, G. F. Dawson, J. Myers and J. Smith, J. Poole, J. Taylor.

Weighing, &c.—M. B. Tetley.

Wheels for Carriages, &c.—C. Wicksteed, G. Cotton and C. H. Smith, G. Glossop and E. J. Cavill. H. Wedekind (com.)

Winding Threads, &c.—K. H. Cornish, A. C. Henderson (com.), W. Greatwich.

Windowblinds, &c.—W. H. Richards and H. Skerrett.

Windows and Sashes.—C. Causley, H. Brittain, C. T. Mazzetti, T. Hyatt.

Wire, Wire Working, &c.—J. Mitchell, J. H. Johnson (com.), J. C. L. Loeffler, G. Edwards, J. T. King.

Wood and Veneer.—T. L. Alemand.

Yeast.—W. R. Lake (com.)

Zinc (Salts and Oxides).—S. Pitt (com.)

⁂ *The above List is prepared from the Patent Records by Mr. T. Morgan, Secretary of the Inventors' Patentright Association, Limited.*

RECENT AMERICAN AND FOREIGN PATENTS.

An improvement in apparatus for drawing and preserving malt liquors, patented by Mr. John Neumann, of New York city, is designed for the purpose of drawing malt and other liquors from a barrel or other vessel, without the admission of air or gas thereto, so that the liquor remaining at any time in the barrel will be prevented from becoming stale.

An improvement in speed-accelerators has been patented by Mr. James Schofield, of New York city. The object of this invention is to convert slow or slight motion into rapid or extended motion by the intervention of ropes or chains and sheaves for the purpose of propelling boats, vehicles, machinery, and the like. The invention consists, essentially, of a sliding carriage containing several sheaves, and fixed on a reciprocating rod, while over said sheaves and sets of corresponding standing sheaves fixed opposite, and at a distance a rope or chain is passed back and forth in such a manner that a slight movement of the carriage will produce a very extended or accelerated movement of the bight of the rope or chain, or of objects attached to it.

An improvement in vehicle-wheel hubs has been patented by Mr. Lucius S. Edleblute, of Cincinnati, Ohio. This invention is an improvement in the class of metal wheel-hubs in which the spoke tenons or butts are clamped between flanged collars, one of which is adjustable on the axle-box to adapt it for convenient adjustment or removal, and it pertains to a peculiar construction and arrangement of parts which cannot be clearly described without an engraving.

Mr. Benjamin Slusser, of Sidney, Ohio, has invented an improved elevator for warehouses and other buildings, constructed with a view to securing greater safety against the sudden fall of the elevator platform from the breakage of the rope, and to provide against persons falling through the hatchways in the several floors. The invention consists in a novel automatic clutch for arresting the descent of the platform in the event of the sudden breakage of the rope, and in the peculiar means for opening and closing a set of automatically operated trap doors for the hatchways, which are opened above and closed after the platform in rising, and also opened below and closed above the platform in descending, so that at no time is the hatchway left open.

Mr. Lovren E. Hogue, of Sandy Lake, Pa. has invented an improved injector in which the lifting and forcing tubes are so constructed and arranged with regard to each other that the pressure may range from forty to one hundred and fifty pounds without requiring any change in their adjustment, the said construction and arrangement enabling the quantity of water to be so graded that three or more different quantities of water may be injected into the boiler.

An improved implement which will hold a rope or chain attached to the hook firmly and securely has been patented by Mr. James Robertson, of East Cambridge, Mass. It consists in a hook formed of the screw shank, and provided with a cylindrical nut made with an enlarged lower end, the hook arm having a grooved cavity or slot in or through the arm longitudinally in its upper or inner side, the eye, and the head.

An improvement in watch regulators, patented by Mr. Aloys Platt, of New York, is designed to provide a means for more easily and accurately moving and adjusting the regulator lever of a watch. In consists of a screw set upon the regulator lever and engaging in a screw groove made in the regulator bridge, so that by turning the screw the lever may be easily and delicately adjusted.

Reviews.

DR. COLLYER'S RHEEA FIBRE MACHINE.

"Rheea Fibre and Dr. Collyer's Patent Rheea Machine, with extracts on Mode of Cultivation." By Dr. J. Forbes Watson, M.D., etc. Allahabad: Printed at the Pioneer Press. 1879.

In this pamphlet Dr. Collyer gives much information as to his mode of treating Rheea fibre. Perhaps it will be the best course to allow Dr. Collyer to speak for himself.

In the year 1870 the Government of India offered two prizes, one of £5,000 and the other of £2,000, for the two best machines which would separate the bark and wood from the fibre of the Rheea or China grass plant. The Government of India advertised this notification most widely in Europe and America. In 1872 only one person presented himself at Saharanpur whose machine failed to meet the requisitions required. The prize offered was renewed in August, 1877, the competition to take place at Saharunpur on 15th September, 1879. Some twenty-four persons entered the lists from the United States of America, Java, France, England, and India. On the 15th September only ten *bona fide* competitors were on the ground. The trials commenced on the 22nd of September and ended on the 8th of October. The subject of treating fibres has especially engaged my attention since the year 1856, when I took out several patents in England, France, and United States for the conversion of vegetable fibres into paper material, or what is technically known as "half stuff." My success was so great that at the great London International Exhibition of 1862 I was awarded the only medal. The following letter from one of the most distinguished of the then living chemists, Baron Justus von Liebig, will show the value of my invention:—

> "Your important discovery relative to the conversion of straw and other fibrous substances into pulp capable of being converted into all kinds of paper has captivated my attention. I am satisfied that you have accomplished the much-desired object of obtaining a substitute for rags in the making of paper. The simplicity of your beautiful process renders your important discovery most precious, and I hope you will reap the reward of your labours.—With much friendship, I am, my dear Dr. Collyer, ever yours,
>
> "Justus v. Liebig.
>
> "To Dr. R. H. Collyer, Beta House, St.
> "John's Wood, London, June, 1859."

Baron Liebig, at the Congress of Chemists held at Carlsruhe, Baden, 1859, publicly presented me a handsome souvenir as to the estimation my discovery was held in by the eminent chemists present. In 1867 I exhibited a case of some twenty different fibres in different stages of preparation at the Paris International Exhibition, and was awarded the only medal. The announcement of the Government of India in 1870, that they were prepared to give £5,000 and £2,000 prizes, claimed my serious attention. Dr. J. Forbes Watson, of the India Office, London, supplied Rheea stems sent from India in the dried state to those who were disposed to turn their inventive talent to the discovery of a method of cleaning the Rheea fibre. Early in 1872 I had conquered the difficulty as regards the treatment of the dried stems, and sent specimens of my work to the India Office, which are now in the Museum at the Botanical Gardens, Saharunpur. So satisfied was the Government of India of my success that on the 3rd of January, 1873, a special dispatch was sent to London to have my machinery fully tried. (*Vide* report on the preparation and uses of Rheea, by Dr. Forbes Watson, 1875, page 2). The Government of India made it a condition that the prize was only to be given for a machine which would treat the Rheea in the fresh or green state. Those inventors who, like myself, had not the opportunity of obtaining the stems in the fresh condition, were placed to a great disadvantage, as it is next to impossible to make machinery to treat a condition of material not within the reach of being experimented on. Until I arrived at Saharunpur, a few days prior to the recent trials, I had no opportunity afforded me of acting on the green or fresh stems of the Rheea plant. In 1868 I had occasion to devote my attention to the improvement of machinery for the dressing and preparation of flax. Finding the existing machinery most defective in breaking the "shive" and softening the fibre prior to scutching, I invented an entirely new machine, for which, at the Great International Exhibition held at Lille, France, the large silver medal was awarded me; but, for a defect on the part of the manufacturer of the machine, I would have had the gold medal. I subsequently had a machine made by Messrs. Lawson and Sons, Leeds. This I sent to Ireland in 1870, and at the Royal Agricultural Show was awarded the only prize medal. In 1872, at the International Exhibition held in Moscow, where all kinds of flax machinery was in competition, the jury unanimously awarded my invention with the grand gold medal and Diploma of Honour. My machinery was exhibited in Belgium in September, 1872, and obtained the gold medal. In 1873, at the Great International Exhibition held in Vienna, I received the Grand Diploma of Honour; and also for my case of Rheea fibre, in every stage of preparation, the jury awarded me the medal of merit. With this brief history of my invention, you will be prepared to understand that I brought to India the only available machine at my disposal, a small hand flax-breaker, which I most fortunately had adapted to work by steam power. For this I am deeply indebted to the valuable aid received from Mr. R. Alexander at Saharunpur, engineer to the Scinde, Punjab, and Delhi Railway.

This small machine when worked by steam really astonished me, as it acted on 300lbs. of Rheea stems per hour, and removed the bark and saved the whole of the fibre. It is self evident to anyone who will take the trouble to reflect that any machine which depends on scrapers, knives, or scutchers must necessarily lose a large percentage of fibre. As these drag away the bark, with it much fibre is lost. The Rheea stem on being peeled, so as to apparently remove the fibre and the bark, still retains a large portion of fine fibre attached to the woody matter; this must also go with tow and waste refuse if knives, scrapers, or scutchers are employed to remove the bark. My machine, having a beetling and rubbing action, accounts for the large percentage I gave over every other competitor at the recent trials at Saharunpur. Out of one ton of stems fresh cut I obtained 147lbs. of clean fibre, or over 6½ per cent., whereas no others obtained anything near so large a yield for the reasons already stated.

The difficulty I found in using the small machine was that it did not have sufficient capacity to do quantity, and, besides, the fibre had to be passed twice through the machine after being dried. The large machine, which I have ordered to be made especially for the treatment of Rheea fibre, will not only obviate all the apparent imperfections—solely arising from want of size—which the small machine possessed, but will operate in a most efficient manner on one ton of Rheea stems per hour, cleaning them of every vestige of bark or woody matter, and also removing a large portion of the gummy and resinous substances attached to the fibre; in fine, solving in a large practical commercial scale the long-sought problem of successfully treating the Rheea or China grass fibre. I expect that as the machine is being made by the eminent mechanists, Messrs. Lawson and Sons, of Leeds, that those interested in the cultivation and preparation of this valuable fibre will be much gratified in witnessing the machine at work, of which due notice will be given on receiving invoice, which is expected early in February next. I am firmly convinced that the fibre prepared with the large machine will have an average value of £70 per ton in the English and other European markets. I can show that at least £45 clear profit can be made by the cultivation and treatment of the Rheea fibre for exportation from India.

With this object in view, I have determined to form a company in Calcutta to work the invention on a large practical scale, with a capital of £100,000.

The Government of India granted me a patent for the preparation of Rheea, jute, and other fibrous substances on the 26th of October, 1875. The machine, there specified, "demands the use of deeper flutes, and also, when necessary, steeping in boiling water for two hours or more in order to more readily remove the bark." My late experience has enabled me to perfect in detail the machine, identical in principle to the one patented in 1875.

MINING IN NEW SOUTH WALES.

"Mines and Mineral Statistics." Annual Report of the Department of Mines, New South Wales, for the year 1878. By Authority. Sydney: Thomas Richards, Government Printer.

This is a work that puts the mother country to shame, for it is no bloated specimen of red-tapeism, such as some of our larger Blue-books, but a book of interest to all concerned in the progress of mining, well illustrated with maps and plans.

To give any reliable view of the contents of such a work is well nigh impossible; but the following quotation will, we hope, be found to afford good indication of the nature of the work:—

> It is a matter of congratulation that, notwithstanding the yield of gold, which was a few years ago the great mineral production of the country, has considerably decreased, the total value of our mineral productions for the year 1878 remains much the same as that of past years, being above the average value of the last ten years by about £40,000. This result is chiefly due to the increased yield of coal, which has steadily grown, year by year, till out of a total mineral production in the colony for the year 1878 valued at £2,172,000 it reached in that year a value of £921,000.

It is also satisfactory to learn that, as regards other minerals and metals, such as shale, copper, and silver, in which the colony is now proved to be very rich, the production is somewhat greater than in previous years, notwithstanding that the price of one of these metals, viz., copper, keeps at a very low rate.

As regards the production of gold, it may be anticipated that ere long this great branch of our mining industry will revive. There is always the great probability existing of new gold fields being discovered, particularly in that vast unprospected country lying at the west and north-west of the colony; and, in addition to this, the gold miner is now successfully working auriferous reefs at depths at which it was thought some time back improbable, if not impossible, that payable gold could be obtained.

The continued annual yield from our various mines of over two million pounds' worth of metals and minerals is a circumstance of which so young a country as New South Wales may well be proud; particularly when it is considered that this amount is derived not wholly, or even in a great degree, from a metal so uncertain in its yield as gold, but from a variety of other valuable metals and minerals. It may be reasonably anticipated that a great expansion must take place in the production of such vast mineral treasures as the colony possesses, when the improved mechanical appliances are brought into operation amongst us which are now so much in use in many of the old countries of the world, and when the capitalist becomes alive to the great wealth which can be obtained by the investment of his money in legitimate mining enterprises.

The establishment of a separate department of the Government to superintend generally the mining affairs of the country, presided over by a responsible Minister, and having its staff of scientific men and skilled officers, is beginning to exert a salutary effect on mining enterprise. The valuable collection of mineralogical and geological specimens in the mining museum—the assay of ores and metals which can always be made free of cost to the public—the geological surveys made and the scientific information ever being afforded by the Government geologist and his assistants—and last not least, the information on the mining laws, and instruction as to the best and most rapid manner of obtaining a secure holding of mineral land which are accorded to those who ask, by the Under Secretary for Mines—all urge on the path of progress the miner and those taking part in mining ventures.

It is to be hoped that in the future the Mining Department may be of more utility to the public in furthering mining enterprise than it has ever been in the past. Much may yet be done to assist the working miner and to give security to capital by judicious amendments in our mining laws, by affording reliable information on the important subject of water supply to mining districts, and by directions from scientific men on the treatment of ores and minerals. The Legislature has hitherto shown considerable liberality in the establishment and maintenance of a Department of Mines, in the hope, doubtless, that it would tend to the increased production of our mineral resources; and I cannot but express my confidence that it will be proved in the future that Parliament took a wise course in following the footsteps of other countries in the establishment of such a department, and that its maintenance will give a great and continued impetus to the development of the vast mineral wealth which in New South Wales now—to a great extent—lies dormant awaiting additional enterprise and capital.

The value of the tin and copper raised up to January, 1878, is stated to have been £48,613,136 11s. 4d.

CASSELL'S SERIALS.

We are glad to find we have space left to observe that Messrs. Cassell's serial, "Great Industries of Great Britain," "Dictionary of Practical Engineering," and "Science for All,' still proceed successfully and judiciously."

REVIEWS POSTPONED.

⁂ We are compelled to pospone several important reviews.

THE EARTH COLUMN.

This invention—an explanatory statement (illustrated by accompanying drawing) received from Mr. George Barnard, of Edinburgh, has reference, it is stated, to a new or improved mode, or means and appliances, for removing and separating organic matter and salts from urine, and all fœcal matter from the sewage discharged from water-closets or other waste-pipes in dwelling-houses and other buildings, and also for purifying or treating the sewage of towns and villages; which improvements will promote the health of cities, towns, and villages, by preventing the escape of deleterious gases into the atmosphere, or any sewage matter into rivers or other watercourses, whilst the whole of the salts and organic matter, both of urine and fœculent matter, are reserved for the use of the agriculturist.

The sewage from the soil-pipe of a water-closet or other waste-pipe is discharged by a pipe or tube passing down and through or outside the wall of the house into a cylindrical iron receptacle of any convenient size (say of about four or five feet high, and about eighteen to twenty-four inches in diameter), through an open mouth in the cover of the latter, into which the pipe passes, and is made air-tight by a rubber ring fitted round it in the neck of the cover. The cover of the receptacle is of lead of conical shape, and is also made air-tight, either by a rubber ring fitted between the cover and the vessel, or by a water-joint formed by the cover dipping into a groove containing water in the upper edge or rim of the receptacle; or this groove may be stuffed with earth. The iron receptacle or vessel is perforated at the bottom and filled with fresh earth to the depth of about eighteen inches, so that the sewage in passing through it has the fœcal and solid matter separated and retained above the earth, whilst the liquid portion sinks or filters through the earth and through the perforations at the bottom into a second vessel, preferably of earthenware, and of about the same dimensions as the first, on which the iron vessel rests, and for which it forms a cover, held air-tight round the outer edge by a rubber band or ring, or the iron vessel should rest on the rubber ring; or by a water-joint or earth stuffing, in the same manner as the top cover. This earthenware vessel is also partly filled with earth, but to a slightly greater depth (as about two feet), and is also perforated at the bottom; and the liquid sewage passing through the earth in this vessel is further filtered, a residue of solid organic particles being retained or absorbed by the earth, and some of the volatile matter and salts and organic matter of urine also.

The liquid sewage passes through the perforations in the vessels into a further series of about four or five such earthenware vessels, placed in a tier each below the other, and containing earth varying in depth from about two feet in the upper vessel, immediately below the iron receptacle, to about three feet or more in the lowest, and fitted with air-tight joints between them, as already described; and the fluid portion of the sewage passes from the lowest vessel in a purified and almost clear state, free from organic matter, either directly to a common sewer, or into a small cistern discharging into a sewer, and having a stop-cock and tap for drawing off a portion of the liquid at intervals, for the purpose of testing the water and the efficacy of the filtering vessels.

The cover of the upper iron receptacle is made to slide air-tight up and down on the discharge pipe leading from the water-closet, so that the receptacle can be removed from below it, and a narrow slit is cut half-way round near the upper edge of the receptacle, and covered air-tight with a rubber flap or valve fitted to the inner side, so that a circular iron plate or flat lid may be pushed into and cover the contents of the receptacle before lifting the cone-shaped permanent cover, the flat plate fitting securely into a groove or having catches to fasten it.

The iron upper receptacle collects the solid contents of the water-closets or waste-pipes, and on removal another similar vessel charged with about eighteen inches of fresh earth, is fitted in its place, and the cover lowered and again closed air-tight.

The impure air and gases which generate in the iron receptacle at the top of the tier are, by preference, conducted by an exit pipe to the bottom of a long metal box, which may stand on a bracket fixed on the wall of the house, or other convenient situation, and this box is filled with charcoal to absorb the deleterious gases which pass through it, and the purified air escapes by a tube or opening at the top; or the gas pipe may be connected from house to house, and conducted to a distance, and the gases burnt in a small furnace as they escape, or they may be utilised.

The whole tier of earthenware vessels and the iron receptacles may be fixed to the side of the house or building, and they may be encased in a tower of brickwork, or may be made to represent an ornamental column. And the contents of the closets of several flats of dwelling-houses, or of hospitals, or other institutions, may be led to the receptacle at the top of the tier without any gas being allowed to escape; the water-closet traps inside the houses, and the air-tight fittings between the conical cover, and between each vessel, effectually preventing any outlet of impure air or deleterious gas, and the earth in the vessels absorbing all organic matter from the fluids that pass through them.

If there are water-closets on the basement storey of a house, the tier of earth filters must be sunk in a well below the basement storey and outside the house.

The removal of the upper iron receptacle would probably be required about once a week in ordinary private houses, and daily from houses accommodating several families, or in the case of one receptacle and tier of filters serving several houses. The upper earthenware vessel would only require to be removed and replaced once in two months or thereby, the next lower about every four months, the following one about twice a year; and if there is still a lower vessel, that might be removed and replaced annually. The earth in each one of these earthenware vessels will be fully charged with ammonia, phosphates, and urates, &c., before removal.

These deep filtering receptacles, removed as described from each tier or column of earth filters, with their close slides or covers applied to prevent the escape of gases, are preferably by special improved arrangements transferred to the country in their vertical position, either placed on shallow trays, or in a liquid tight box cart or waggon, which would retain any liquid filtering through the receptacles, thus preventing waste or loss in their transit. But a time should be chosen for removal—say, early morning, when the contents of the iron receptacles are nearly dry.

These carts or waggons should be specially constructed for arranging the deep receptacles compactly and steadily in upright rows, for which purpose the waggon would be made very low, with deep sides and kneed axles, so as to admit of the use of large wheels, and of convenient loading and unloading of the deep receptacles in their vertical position; and the same waggon would serve the purpose of bringing back the clean vessels with filtering earth renewed, all in a vertical position, ready for re-application as hereinbefore described.

Ordinary common loams will answer every purpose; very stiff clays would not filter quickly enough.

Severe degrees of frost must be provided for by coverings, or sinking the columns in dry wells, though decomposition by vital action in the earth contained in the filters may generate heat sufficient to counteract the effect of extreme cold.

There should be small overflow-pipes opening near the top in each vessel, and leading to the one below.

The charcoal-box might be dispensed with, but there must be a small gas-pipe leading to the top of the house.

In crowded cities the "Earth Column" should be sunk in a well, and communicate with sub-railways. These sub-railways are not included in patent.

This plan can be introduced into towns, by degrees, one street, or part of a street, may adopt it; twenty average four storeyed houses would produce a load for one waggon once a week or oftener. The cost of carriage would amount to considerably less than five shillings per head of population per annum.

KOPF'S EXTRACT OF MEAT.

THE *Times* recently observed with regard to the products of Kopf's Extract of Meat Company, Limited:—" Kopf's consolidated preparations, which were used with signal success in South Africa, supply a long-felt and much-needed want. What traveller has not felt grateful to Liebig for his extract of meat, or to our own high-class firms whose tinned provisions have often proved a substantial addition to meagre fare in distant lands? All these were beyond the reach of the private soldier, were expensive and bulky. Kopf's preparations are inexpensive, they are nutritious, and are extremely portable. In Zululand our soldiers spoke most highly of them, and even in England they are not despised in the barrack room. A small tin cylinder weighing but 1½oz. contains ample for a meal; three of these among two men are all a soldier requires in the day. Soups of various kinds, containing compressed vegetables in greater or less quantities, are the preparations most appreciated; but compressed tea, milk, and sugar are luxuries which campaigners will not pass by. Three minutes' boiling in a soldier's canteen is all the cooking necessary for a meal. It certainly seems extraordinary that in the face of the unqualified approval bestowed on the compressed food by both officers and men in South Africa more efforts have not been made by Government to introduce it in Afghanistan. Had General Gough been provided with a supply of these provisions, there need have been no delay for want of transport or supplies. One mule can carry 2800 tins of Kopf's soups, or rations for a whole battalion for a day, a camel can in like manner carry over rough ground more than two days' rations. Each man without much difficulty could slip a supply for a couple or three days into his haversack. Here, then, we have the whole secret of waging war with minimized transport, and consequently at a reduced expenditure. It is not that these compressed foods should supersede the ordinary rations; but on certain occasions when light marching order becomes necessary, their introduction would be attended with the most valuable results, and would make the general practically independent of transport or of the country through which he was marching. How many flying campaigns into the hills would have been successfully conducted at a tenth of the expenditure incurred had the invention been known when first we annexed the Punjab! A reduced transport train means reduced baggage guards, extra rest to the men, and finally enables us to move with smaller forces. It will be argued that, however valuable such food may be for our own British soldiers, the caste prejudices of the natives will prevent their ever agreeing to its introduction. There is no reason why the staple articles of diet used by the Sepoys should not be similarly compressed, and under the superintendence of their own cooks; rice, dhal, ghee, vegetables, all and each of them may be operated on in the same manner as pea-soup and Scotch broth; intelligent native officers will not be found wanting who will readily agree to the advantages claimed by the inventors. . . . The question of transport is one which affects our Government in no small degree, and anything which promises to lighten the vast sums incurred on this head should at any rate receive an honest, impartial trial."—Similar expressions of opinion will be found in the *Broad Arrow*, *May Fair*, *Army and Navy Gazette*, *Bullionist*, *London Figaro*, *Whitehall Review*, *&c.*

NEW COLOURING MATTERS.

THE new acid green, we learn, can be used for wool by dyeing with oxalic acid in the dye bath. On cotton it is dyed by mordanting first with sumac over night, then passing through tartar emetic, and dyeing in a tepid bath with the necessary amount of colouring matter. On calico it is printed with tannic acid or sumac extract, like methyl green; it is then steamed and, we understand, passed through tartar emetic. The acid green has the advantage that it does not run in steaming if used in connection with picric acid, a fact of great importance in printing; and furthermore, it resists the action of the heat without losing its shade. To print on wool, take 2½ gallons boiling water for 1 lb. green; filter and add 2½ gallons gum water and 3 lb. glycerine.

The Austrian firm, Przybran & Co., patented some time ago the production of a sulpho-derivative of alizarine and purpurine under the name of alizarine carmine, which they have now introduced into the market. The new colouring matter is used for dyeing wool, and is recommended as a substitute for madder in all its applications for wool dyeing. It is said to give nicer and purer shades. The alizarin càrmine dyes wool of a red colour when the latter is mordanted with tin crystals of alum. The sulpho-acids form salts with different bases. The alum salt can be used direct for dyeing wool; however, it is better to use the soda salt on previously mordanted wool by adding tartar to the bath. Different shades are obtained with different mordants.

We see in a foreign contemporary that the firm of Guinon, Jne., & Picard, in Lyon, have lately brought out a product under the name of hematine (hæmateine) a derivative of logwood. Hemateine ($C_{16}H_{12}O_6$) is formed from the chromogen of logwood, or hæmatoxyline ($C_{16}H_{14}O_4+3H_2O$) by treating it with ammonia. By this reaction hemateine-ammonia is formed, which gives hemateine either by evaporation in vacuo or by boiling with acetic acid. Hemateine forms in this case a brownish red, and almost black precipitate, which assumes when dry a greenish metallic appearance like that of some of the aniline colours. When sharply ground and passed through a sieve it takes a redder colouration. It is soluble in water, alcohol, and ether. Hæmatoxyline is with hæmateine the colouring substance of a solution of logwood, which contains as well all the soluble substance of the dyewood. Hematoxyline gives with ammonia næmateine; the latter is also formed by sprinkling logwood with urine and by fermentation. The product has already been known for a considerable time; its cost, however, was so high that it precluded its application in dyeing, but the above firm have discovered a process by means of which the hæmateine is obtained much more cheaply than hitherto, and the product has already found its way into the dye houses of France, Switzerland, and Austria, to such an extent that 2,000 kilos. are daily produced in the works of Messrs. Guion, Jne., & Picard, and they are making alterations in order to more than double their output. The brownish black product is completly soluble in water like logwood; it dyes blue blacks, and does not rub off; 15 kilos. hæmateine are said to be equal to 100 kilos. best logwood, over which it is said to possess great advantages, as well as over logwood extracts.

CAULINE.—Messrs. Savigny & Collineaux have exposed, in an Exhibition of Science as applied to Industry in Paris, samples of *Cauline* (the dye from cabbage) in powder, for solution in the dye bath, and as violet, lilacs, blue and green lakes, and as cauline black for leather dyeing. The two colouring matters, alneine and ericine, we alluded to in our October issue, have also been exhibited in powder, solution, and in paste; the latter also as dry lakes for calico printers and paper stainers.

The alneine can be employed instead of cachou in all its applications. On silk, wool, cotton, and jute it is said to give brown, salmon, and mouse gray shade, which are especially beautiful on jute; the shades are of great brightness and solidity, resisting chlorine and any amount of washing.

Cauline, which is extracted from red cabbage, is prepared dry or in syrupy extracts. On wool grayish colours are obtained, varying from silver grays to dark slate. Grayish and gray lilacs, as well as moss greens, can be obtained by cauline without the aid of any other dye stuff. Every metallic salt gives a different but constant shade with cauline, so that by using different mordants several shades can be obtained by dyeing in the same bath, and this latter can be kept and used for a considerable time. Wool dyed with cauline has great affinity for indigo, and very dark blues can be obtained by first dyeing with it, and then adding carmine of indigo to the bath.

On cotton the mordants used for wool give exactly the same shades when used with cauline, a fact of great importance in dyeing mixed goods. Used alone, it gives on cotton a violet and a peculiar blue shade, called cauline blue. For furniture articles, those of jute especially, it is reported that the three colouring matters we have described will be found of very great advantage either for dyeing or printing. Further, from cauline a black extract can be produced, which dyes leather blue black. Besides these colouring matters, Messrs. Savigny & Collineaux exhibited at the same time a great variety of tasteful patterns dyed with their new products.—*Textile Manufacturer.*

Mr. Thomas G. Brown, of New York city, has patented improvements in the construction of combination lock bracelets, the object being to enable the lock-bar or staple to be entered into the socket of the lock when the two parts of the bracelet are pivoted together, and it consists in connecting the lock-bar or staple with the end of the bracelet opposite to that on which the lock is placed by a concealed pivot, so that when the two ends are brought together the bar will turn sufficiently to enable it to enter with ease the straight socket in the lock.

BRILLIANCY IN LIGHTING.

On Thursday, February 26th, Mr. J. Cadett, read a paper at a meeting of the Inventors' Institute, "On Brilliancy in Lighting," especially as regards the use and misuse of the lime light, in which particular reference was made to various improvements in limelight apparatus. Admiral Selwyn, Vice-President, occupied the chair. The lecturer said that the limelight was rather of ancient date. It was first used in 1820, and since that time, with the exception of new appliances for facilitating its use, we had made no very great improvement in it. It was to be hoped that in time we should learn how to extract oxygen from the atmosphere easily, when the electric light would not be able to compete with the limelight. For the purpose of testing colours of silks and stuffs, the limelight was immensely superior to gaslight. The lecturer explained the improvements which had been made of late years in the apparatus for making the limelight, and said that now the fear of accident was reduced to a minimum. A few general remarks concluded a very interesting lecture. Mr. Steward, the well-known optician, then exhibited a number of experiments with his improved lantern, the effects being very good. The apparatus used by Mr. Steward in illustrating Mr. Cadett's lecture, comprised—the Bridgman triple lantern with recent improvements of the mechanical arrangements for producing rolling-up view and curtain effects; a combination of chromatic lenses to produce six different sized discs at the same distance from the screen, the same size disc at six different distances; improved combination or interchanging jets to use with high pressure mixed gases, or as a "separate" (whether oxygen is used in the bag and the hydrogen from the main) by simply removing a collar and fitting in a different nozzle; telescopic adjustment to front tubes to get necessary length. Mr. Steward, it was stated, was the original designer and introducer of the triple lantern in an upright form suitable for working by one operator, and obtained a registration in the year 1874. Besides the above. were also shown: Chadwick's improved generator and oxygen gas holder; Chadwick's safety valve to prevent the return of gases, and modified double purifiers and interceptors (Mr. Highley's).

FRESH MEAT FROM AUSTRALIA.

Not long since, a number of visitors assembled by invitation of the firm of McIlwraith, McEacharn, and Co., Leadenhall-Street, on board the "Strathleven," one of the Burrell & Son's line of steamers, now lying at the west quay, East India (Import) Dock, London, to inspect the "meat room" and the machinery, and to practically judge of the experiment of the practicability of bring fresh meat by the freezing process from Australia, the first consignment of which came by this vessel.

On November 29th the vessel left Sydney, having on board 55 carcasses of beef and 357 carcasses of mutton. She proceeded to Melbourne, where an addition was made to that portion of her cargo by the shipment of 5 carcasses of beef and 205 carcasses of mutton, the total weight being from 30 to 33 tons. The "Strathleven" is 1,588 tons register, 2,436 tons burden. She left Melbourne on December 6th, passing through the Suez Canal, and arrived at London on Monday, February 2nd. The whole of the meat must therefore have been killed about two months since. The chamber in which the carcasses were stored is about 26 feet square, and 6 feet 6 inches in height, and connected with it is an engine fitted with refrigerating apartments, the air being drawn out of the room, compressed, and chilled, and then forced back again through about 300 feet of piping. By these means an average temperature was kept during the voyage of from 10 to 15 degrees of frost; on Friday, although until the middle of the day the engine had not been at work since Sunday or Monday, the temperature was 23° Fah. About 3 tons of butter were also brought over in the same department. The vessel was 23 days in the tropics, and in the Red Sea the temperature was from 72° to 74°, but no difficulty was experienced in keeping the "meat room" at 12° of frost. It was not found necessary to have the engine constantly at work, and no chemicals were used.

After the inspection, the company sat down to luncheon, which consisted almost entirely of Australian fresh meats which had been brought over in the "Strathleven," The *menu* comprised lamb cutlets, beef olives, stewed chops and asparagus, minced collops, roast beef, mutton, and lamb, boiled mutton, and corned beef.

The Premier of Queensland (Mr. T. McIlwraith), said it was the immense undeveloped resources of that colony which prompted the chairman to try the experiment of which the success had been proved that day. About £5 per head had been paid for the bullocks, which would have cost £28 or £30 per head in England. He referred to the immense capabilities of New South Wales and Queensland for producing meat, and expressed the belief that in the future a great trade would be developed. They could produce meat and sell it at a profit of 2d. per lb., and he had no doubt it could be placed before the British public for 4d. per lb.

Mr. A. McIlwraith, in responding to the toast of his health, said that the meat was purchased at about 1½d. per lb., and was expected to realize 6d. to 7d. in Smithfield Market. He hoped that in a short time he would be able to collect such information as would show that this meat could be imported on a much larger scale. If they could bring from 100 to 150 tons per week to England, it would relieve the surplus produce of the Australian colonies. Mr. T. McIlwraith next gave the health of Mr. James Campbell, C.E., who, he said, had really carried out the details of the experiment.

Mr. Campbell said that although fears were entertained for the success of the enterprise before they reached the tropics, no difficulty was experienced in passing through those regions, and he should have had no fears for the success of the experiment, even if a temperature had been experienced of 90°.

AUSTRIAN PATENT LAW.

We have to inform our readers that according to a decision of the Imperial and Royal Austrian Ministry of Commerce, taking effect from 1st March last, it is no longer necessary that foreigners applying for letters patent in Austria produce (1) the copy or original of their foreign letters patent, or (2) proof that their foreign patents are in force. (3) It is also no longer necessary to prove the working of the patent. Austrian patents will only be declared null and void when a suit is entered to have the patent annulled, and the patentee is unable to bring evidence to prove that his patent was worked in due time. We feel sure that inventors will welcome this decision of the Austrian Ministry as an immense improvement which shows that the Imperial Ministry wishes to encourage foreigners to protect their inventions in Austria.

Mr. Charles Bried, of Newark, N.J., has patented a mail bag fastening formed of four metallic strips of equal length, hinged together at the ends, having axes, with perforated arms on two of the strips and slots in the two opposite ones, having the axes adapted to be revolved so as to make the perforations in the arms coincide to receive the lock.

THOUGHTS ON THE DEATH OF A FRIEND.

In Memoriam.

Speak not of death, but of a life begun!
That heavenly seal which rested on the brow
Of her who wears a crown of glory now,
Was promise of a Life beyond the sun:
And, like th' imprisoned lark that longed to rise
(Though beauteous was the cage), the soul inspired
With hopes of endless joy and peace, desired
To mount with wings of faith above the skies.
Her lovely face was index to the gem
The casket held—a pure and peaceful mind.
Her bright example rests with those behind,
Who prayed for her: she prayeth now for them.
O, let us bless His holy name, and say—
"The Lord who gave, hath taken her away."

Redivivus.

Fair Nature's garden rested for awhile,
When winter's stormy winds were past and gone,
Until the sweet and long-expected smile
Of spring gave promise of a life to dawn.
The winter of our loved one, too, has passed,
Her years of patient waiting-time are o'er;
Her brightest hopes are realised at last;
She lives in glory now for evermore!
Two angels visited the earth one morn,
Each bearing from on high life-giving power;
And while a living soul to Heaven was borne,
Awakening Nature blossomed in that hour.
O grant it, Lord, this lesson may impart
That Thou the Life and Resurrection art.

Not lost, but loving, helping still.

Her faithful, loving heart has fled away!
Constrained by earthly cares it beats no more,
Ennobled by those cares which now are o'er;
Her spirit pure no longer here could stay.
Nor dare we mourn one ready to obey
The heavenly message, and prepared to pour
Her praises out upon the golden floor,
While we can only turn aside and pray.
Our best to Him we yield without a fear,
The wisdom, power, and love, tri-unity:
For though the home she loved is sad and drear,
'Tis hallowed by the holy memory
Of her who, though unseen, we feel is near,
Guiding us onward to Eternity.

A. B.

THE BENZOATE OF SODIUM IN CONSUMPTION AND DIPHTHERIA.

The inhalation of the benzoate of sodium in phthisis continues to attract attention in Germany. Prof. Rokitansky, of Innspruck, was the first to advocate it, and Dr. Winternitz and others who had visited his clinic report upon it very favourably. They aver that nearly all cases improve upon it, at least at first. This result is categorically denied by many other observers.

Its success as an agent in diphtheria is attested by Dr. Letzerich, of Berlin. The pseudo-membrane is dusted with powdered benzoate, applied through a glass tube or quill, two or three times a day. Older children may use a gargle of one part to twenty. The temperature and pulse together decline under this treatment. The pseudo-membrane contracts and becomes thinner and more transparent.

An improvement in snap hooks has been patented by Mr. John B. Hampton, of Pomeroy, Ohio. This invention relates to an improvement in fastening buckles, loops, and hooks to harness, bridles, &c., and the object thereof is to enable the connection to be made without stitching or riveting.

THE SCIENTIFIC REVIEW
AND
Scientific and Literary Review
(Journal of the Inventors' Institute)
Is published at the
OFFICES, 21, COCKSPUR STREET, CHARING CROSS.
LONDON, S.W.,

In the 1st week of every Month, sent post free on prepayment of the ANNUAL SUBSCRIPTION OF 6s. 6d.; or it may be had by order, from Messrs. KENT AND CO., Paternoster Row, or any Bookseller or Newsagent in the kingdom, *price* 6d. *per copy.*

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Editor's Office: 21, Cockspur Street, Charing Cross, S.W.

THE INVENTOR'S INSTITUTE,

4, ST. MARTIN'S PLACE, TRAFALGAR SQUARE. LONDON.
ESTABLISHED 1ST MAY, 1862.

Past Presidents:

SIR DAVID BREWSTER, K.H., LL.D., F.R.S., &c., from the establishment of the INVENTORS' INSTITUTE, till his decease, February, 1868. LORD RICHARD GROSVENOR, M.P.

President, SIR ANTONIO BRADY.

THE SESSION 1879—1880

Members' Meetings will be held at 8.15 p.m. on Thursdays, April 8th and 22nd; May 6th; and June 3rd.

On 8th April, Exposition of Inventions, and Patent Law Question.

On 22nd April, Mr. T. Morgan will read a paper on some recent inventions of considerable importance.

Executive Council Meetings at 7.30, on same evenings as above.

Annual General Meeting, Thursday, May 20th, at 4 p.m., unless otherwise arranged.

Subscriptions are payable to Mr. G. A. STRETTON, the Receiver, 4, St. Martin's-place, S.W., who is the proper official to give receipts.

F. W. CAMPIN, Sec.

Proceedings of the Institute.

MEMBERS' MEETINGS.

On the 26th February Mr. J. Cadett read his paper on "Brilliancy of Lighting," with special reference to the use and misuse of the limelight. A report is given in another column. Admiral Selwyn, Vice-President, occupied the chair. The paper was illustrated by dissolving views operated by an improved apparatus supplied by Mr. Steward, the eminent optician, which proved highly entertaining to the ladies and gentlemen present, and showed that the improved was much superior to the unimproved apparatus. There was little discussion, but hearty votes of thanks were passed to Mr. CADETT, Mr. STEWARD, and the Chairman.

On the 11th March a Patent Law Conference was held, Mr. M. Zingler in the chair. Mr. A. J. Murray, Mr. Greenfield, and Mr. Morgan advocated the establishment of a sound International Patent Law.

On the 25th March Mr. Greenfield, who was to have brought some important matters before the Institute, was prevented from doing so by ill health.

EXECUTIVE COUNCILS.

On the 11th March, no business requiring to be reported to the members in general was transacted.

On the 25th March, the proceedings were confined to the transactions of ordinary financial business.

Monthly Notices.

Mr. T. E. Page, M.A., assistant-master at Charterhouse, and formerly Fellow of St. John's College, Cambridge, who has recently contributed a school edition of the first book of Horace's Odes to Messrs. Macmillan & Co.'s series of "Elementary Classics," intends publishing in the course of the next few years similar editions of the remaining books.

The death is announced of the Slavonic philologist Sresnewskii at the age of seventy-eight.

Dr. William Proctor, M.D., of Petergate, York, died on the morning of Sunday, the 7th inst. He was the Honorary Secretary of the Yorkshire branch of the British Medical Association, and Vice-President of the Yorkshire Philosophical Society. Dr. Proctor published in 1872 a work on 'The Hygiene of Air and Water.' He was the author of another useful book, 'The Practical Chemistry of the Non-Metallic Elements.'

The Yorkshire College of Science, Leeds, is considering the question of establishing a chair of agriculture. Dr. Heaton has addressed a letter to the agricultural association of the county, endeavouring to elicit information by which the Council may be guided. One section of the new buildings for the college is rapidly approaching completion.

The American Academy of Arts and Sciences will celebrate its one hundredth anniversary on the 26th May next.

Experiments on the growth of plants under intensified light are described by M. Pringsheim in the *Chemisches Central-blatt*, which he finds, under all colours, destroys the green colouring matter, but the blue rays effect the change in chlorophyll more rapidly than the red rays. The change, indeed, appears to be independent of heat, but it does not take place in the absence of oxygen.

Lord Selborne and Mr. F. G. Bramwell, chairmen respectively of the Council and executive Committee of the City and Guilds of London Institute, have addressed a letter to the Prince of Wales, as President of the Commissioners for the 1851 Exhibition, proposing to build a college for advanced technical education at a cost of £50,000 and upwards, at South Kensington, and to maintain the same at an annual charge of £5000 per annum above the amount of fees received. It is stated that the Executive Committee of the 1851 Commissioners recommend the acceptance of these proposals.

Restoring green colours to leaves.—According to Prof. Church, withered leaves of the usual autumnal colours—yellow, red, or brown—can be rendered green again by steeping in water along with a little zinc-powder.

The chloride of methyl is now used in extracting the odoriferous principles of plants. It enables the manufacturer to dispense with the tedious process of *enfleurage*.

The flowering period of trees, according to Dr. Staub's observations in the *Botanische Zeitung*, is hastened only when the mean temperature for the month is at least 3·5° F. higher than the average: a smaller increase does not affect vegetation. On the other hand, the smallest fall in the temperature of the month occasions a retardation.

In-breeding is not injurious, according to some observations on the cattle of Brittany made by M. Bellamy, who has thus been led to question the common doctrine.

Messrs. Griffith & Farran have in press a little volume of dialogues, by the use of which, as a class reading-book, it is believed that children will unconsciously and pleasantly gain some knowledge of the earth's surface and movement. "Glimpses of the Globe," as the volume is named, is by the author of some hints on school management, entitled "The Teacher," which were published last year by Messrs. Macmillan & Co.

M. le Bon, in a memoir recently crowned by the French Academy of Sciences, shows that the differences in the cranial development of individuals of one and the same race become greater the higher the race rises in the scale of civilisation. Hence, far from tending towards equality, men tend, on the contrary, towards increasing differentiation.

The Scientific Review
AND
SCIENTIFIC AND LITERARY REVIEW,
INCORPORATING THE "JOURNAL OF THE INVENTORS' INSTITUTE."

APRIL, 1880.

PATENTS AND POLITICS.

In the Parliamentary elections which have just taken place, and those in progress, we fear there is little utilization of them for the true interest of the country, scarcely any notice being taken of such great questions as the promotion of our industrial progress of which the Patent Law is the most practical branch; technical education and agricultural advancement,—everything being swamped by the reiteration of Whig and Tory Shibboleths with no reference to anything but the ascendancy of one party or the other. Now this is certainly a very lamentable state of things, for if these questions—and especially the Patent Law—be not fundamental, two and two do not make four. Foreign policy, Imperial consolidation, and other large questions, are by no means superior to them, the assertions of party politicians notwithstanding.

The Scientific Review is, of course, neither Whig nor Tory, Conservative nor Liberal, but when it finds the government of the one party or the other is inimical or indifferent to the development of practical science or the progress of industry, then it ought to do its best to publish such an important fact. The present Government, which is known as a Conservative one, in 1876 undertook to promote legislation on the patent laws, and the question was referred to as an important one in the Queen's speech delivered at the opening of Parliament that year, but in consequence of the opposition that was made to some of the proposed enactments of the Bill (which was brought in during that session), which were in effect subversive of the principles of Patent Law as a security for patent property, the Bill was dropped. However, before the final disposal of this Bill occurred, the Lord Chancellor had inserted very considerable amendments, and in the next Session of Parliament this Bill, in its improved form, was again brought before Parliament, but being still very objectionable, so much opposition was made to it, that it was withdrawn. In the year 1878 the matter was again referred to in her Majesty's speech, and, in consequence, a Bill very similar to the Lord Chancellor's was brought into the House of Commons by Sir John Holker, the Attorney-General, but as this Bill contained most of the objectionable clauses of the former Bill, though a great improvement thereon, it was opposed, and the Government thought fit to let it drop.

When it is called to mind that during all this time the Government had a very considerable reliable majority in the House of Commons, one cannot help thinking that the Patent Law was used very much like a plaything with which to pass the time away, instead of being treated, as what it really is, a vital question for the prosperity of the country.

Now, although we deem the Government decidedly blameworthy in this matter, we do not mean to say that the former Government took such action in the Patent Laws as real statesmen should do; for we know full well that, whether on the one side of the House or the other, there are pseudo-statesmen who oppose any kind of Patent Law as being a monopoly system; yet what we do point at is the fact that Lord Beaconsfield's Government, although publicly acknowledging the importance of the Patent Laws, and the necessity for their improvement, nevertheless abstained from amending them. On one important point it seems very unlikely that the present Government (if retained in power by electoral action) will do anything to benefit inventors, and that is—reduction of the cost of Patents; for it is clear that this cannot be reasonably expected from a Chancellor of the Exchequer who can select to make up his deficit such an objectionable impost as the Probate Duty, which is, in fact, a heavy tax upon a fulfilment of a requirement of the law, exacted in such a way that people have often to borrow money to pay it; thus not very unlike the Patent Stamp duties, a tax upon benefits that may accrue, and not upon benefits received.

Another ground for not trusting that any really favourable action in the Patent Law will be taken by the Beaconsfield Government, is that very recently the *Times*, which has unmistakeably shown itself to be the *fidus achates* of that Government, has, after having some time ago written in favour of the Patent Laws—again taken to vilifying them—according to its usual style, propping up untenable propositions by what may be very mildly termed sophisms, the latest utterance being with regard to the recent decision of the Court of Appeal in Von Heyden *v.* Neustadt (with reference to the salicylic acid patent infringed by making the acid abroad and vending it in this country), as to which the *Times* makes the assertion that "Patents are never very popular except among patentees," which has so little truth in it that we can only characterise it in the same terms as our contemporary *Engineering* has done, who remarks: "It would be interesting to know whence this erroneous impression—for erroneous it most certainly is—was obtained. We have from time to time ascertained the views of very many having no direct interest whatever in inventions or patents, and we cannot call to mind a single instance where opinion has been the reverse of favourable to the protection of inventions: not only as a matter of justice to the inventor, but also on the broader ground of public expediency—and all the evidence from time to time collected goes to support this view, and to show that those who object to patents are usually manufacturers who would be gainers by being able to use, free of royalty, some patented invention belonging to another. We will not go into the details of the particular case cited by the *Times*, though we may say the decision appears to have been sound and equitable. Even that journal does not, in a direct way, quarrel with the principle the Court of Appeal has enunciated. But it seems to us exaggeration to say that the principle enunciated might produce results, if a grasping greedy patentee were to enforce his rights, 'which would be fatal to the whole body of the Patent Law.' We also take exception to the assertion that the law does not make more friends the longer it lasts. A comparison of the public opinion of to-day with that of a few years back will show how clearly mistaken is the view adopted by the *Times* on this point." It cannot, however, be denied that our Patent Laws are open to improvement in many respects—and therefore the likelihood of their being dealt with by Parliament may perhaps be matter for congratulation—one cannot, however, look forward to the prospect without some misgivings, in view of certain observations the Attorney-General is reported to have made in the House of Commons recently, when Mr. Anderson, member for Glasgow, moved the second reading of his Patents for Inventions Bill.

We would add to these remarks that if the Liberal party comes into power, let us hope that Lord Granville will not be Premier and Lord Selborne Lord Chancellor, as they are declared enemies of Patent Law

Proceedings of Societies.

ROYAL SOCIETY.

FEB. 5TH.—The President in the chair. The following papers were read:—"On the Spectrum of Carbon," by Profs. G. D. Liveing and Dewar; and "On the Epipubis in the Dog and Fox," by Mr. T. H. Huxley.

FEB. 12TH.—The President in the chair. The following papers were read:—"Studies on the Chinoline Series" and "Note on Electrolytic Experiments," by Prof. Dewar.

FEB. 19TH.—The President, followed by Dr. Tyndall, V.P., in the chair. The Right Hon. the Earl of Northbrook was admitted into the society. The following paper was read:—"On Some of the Effects Produced by an Induction Coil with a De Meritens Magneto-Electric Machine," by Mr. W. Spottiswoode.

GEOGRAPHICAL SOCIETY.

FEB. 9TH.—Right Hon. the Earl of Northbrook, President, in the chair. Colonel C. G. Gordon was elected an honorary corresponding member. The following gentlemen were elected Fellows:—Messrs. E. Barber, H. S. Caldecott, J. C. Dimsdale, J. Gavin, J. H. Goodhart, N. A. Jephson, G. Matthews, A. B. Moorhead, E. Rocker, P. L. Sclater, and A. J. Smith. The paper read was "Afghanistan: the Eastern Border of Pishin and the Basin of the Loras," by Major-General Sir M. A. S. Biddulph.

FEB. 23RD.—The Right Hon. the Earl of Northbrook, President, in the chair. The following gentlemen were elected Fellows:—Messrs. W. R. Arbuthnot, G. Batley, E. Haggard, F. Hill, H. C. Huggins, J. Jackson, R. Lesslie, D. M'Carthy, L. K. Rankin, H. C. Stephens, K. Takemura, I. Tokoogawa, and O. Toogood. The papers read were "Mr. Hore's Recent Visit to the Lukuga Outlet of Lake Tanganyika" and "The Marutse-Mabunda Empire in South Central Africa," by Dr. E. Holub.

GEOLOGICAL SOCIETY.

FEB. 4TH.—H. C. Sorby, Esq., President, in the chair. Messrs. F. Bond, C. H. Cobbold, F. Crisp, W. H. Dover, Mirza Mehdy Khan, J. Notman, and J. E. Williams were elected Fellows. The following communication was read:—"On the Oligocene Strata of the Hampshire Basin," by Prof. J. W. Judd.

SOCIETY OF ANTIQUARIES.

FEB. 5TH.—E. Freshfield, Esq., V.P., in the chair. The Dean and Chapter of Canterbury exhibited, through Canon Robertson, a deed drawn up in the year 1072, in the presence of William the Conqueror, his queen, and a council of bishops (whose signatures are affixed), settling the question of the primacy of Canterbury and York. It appeared from some remarks communicated by Mr. E. M. Thompson that another copy of this deed is at Canterbury, bearing many more signatures of witnesses, and having the great seal attached. It also states at the end that the question was first discussed at Winchester, and afterwards at Windsor, and Mr. Thompson gave it as his opinion that the document exhibited this evening was the preliminary deed drawn up at Winchester. The names of the king and queen had been added by a scribe to their crosses, but the other signatures and crosses were probably in the handwriting of those whose names they bore. They consisted of Hubert, the Papal Legate (whose Italian hand, as Mr. Thompson observed, was in marked contrast to that of the other witnesses); of Lanfranc, the Archbishop of Canterbury; of Walchelin, Bishop of Winchester; of Wulstan, Bishop of Worcester; of Thomas, Archbishop of York; of Remigius, Bishop of Dorchester; and of Herfast, Bishop of Thetford. The body of the document will be found printed in Malmesbury's "Gesta Pontificum Anglorum," pp. 42-43, as extracted by him from the "Epistolæ Archiepiscopi Lanfranci" (see Mr. N. E. S. A. Hamilton's note to the "Rolls Series" edition of Malmesbury, p. 39). The document itself will be published in fac-simile in a forthcoming issue of the Palæographical Society. Mr. H. S. Milman called attention to the use of the word "Parochia" to denote the Province of York, the early use of the word being anterior to the existence of parishes in the modern sense. The Rev. J. A. Bennett communicated an account of an interesting series of papers relating to the Crown jewels and plate in the time of Charles I., which he had selected from a much greater number of Jewel House Accounts in the possession of Captain St. J. H. Mildmay, of Hazelgrove House, Somerset. A full catalogue of them will be found in the Seventh Report of the Historical MSS. Commission. Mr. D. Bell supplemented the statements made by Mr. Bennett from the Mildmay papers by some notes which he had extracted from Jewel House Accounts in the Royal Library at Windsor Castle.

FEB. 12TH.—E. Freshfield, Esq., V.P., in the chair. Mr. R. W. Binns exhibited and presented a photograph of the achievement of arms belonging to the Hadley Bowling Green Club, in the parish of Ombersley, Worcestershire, of which the original had been exhibited and described at a previous meeting. Mr. H. Laver communicated a paper on some curious mounds, known as the Salting Mounds, which are found at the edge of ordinary high water, and following the course of the various creeks on the coast of Essex, Kent, Suffolk, and Norfolk, which are evidently, as Mr. Laver believed, of great antiquity, but of which there is no account known nor even any tradition. They vary in height from two feet to five or six feet, and in some cases cover as much as thirty acres, more or less. They are composed of burned earth, and all of them contain fragments of coarse pottery. Mr. C. T. Martin communicated extracts from a catalogue of plate and jewels delivered to Thomas Cromwell on his appointment in 1532 as Master of the Jewel House, descriptive of the same objects as those which nearly a century later (1625) figured in the Jewel House Papers laid before the society at the last meeting by the Rev. J. A. Bennett. Mr. Martin then proceeded to read the second part of his paper on the Accounts Roll of Sir John Daunce, *temp.* Henry VIII.

FEB. 19TH.—E. Freshfield, Esq., V.P., in the chair. Major C. Cooper communicated an account of the discovery of 177 Roman coins (third brass of Tetricus the younger), 2 ft. 6 in. below the surface, in a round heavy lump, on Priestley Moor, in the parish of Flitwick, Bedfordshire. They were found in digging a drain, and the excavation beneath the surface of which they were lying was itself 8 ft. deep. This part of the land was most probably a huge swamp sixteen centuries back, and Major Cooper conjectured they may have been lost by and along with some person who failed to make his way across, and perished in the attempt. Mr. G. Payne, jun., communicated an account of yet further discoveries in his neighbourhood, comprising six Anglo-Saxon skeletons at the west end of the town of Sittingbourne. Nearly all the articles perished in the fall of huge masses of earth, split off by the workmen during excavations for brickwork. With one of the skeletons, however, was found near the skull a small black urn and an iron D-shaped object, probably a padlock, Also a Roman interment near Chalkwell, containing a leaden *ossuarium* in the form of a bowl, ten inches in diameter, containing bones, iron nails, a bronze bowl and jug, a vase of Durobrivian ware, and pieces of a glass vessel; all these were smashed to atoms by the workmen. Also three Roman graves at Bayford and two at East Hall, both near Sittingbourne. Mr. H. C. Coote communicated some notes on the Anglo-Saxon charter exhibited and described by Mr. W. de Gray Birch on January 17th. Mr. Coote's object was to define more closely the territory of the Magesætæ, which he believed to be co-extensive with the county of Hereford—neither more nor less—and to determine within that territory and county the precise situation of the land given by Eadgar to his thane. This he showed to be Stainton-on-Arrow. Mr. F. R. Conder communicated a paper on the date of the Egyptian calendar, and especially of the commemorations therein of the rising of the Dogstar. Mr. R. C. Nichols remarked that it might be open to doubt whether it was the heliacal rising of the star which was commemorated by the feast of Sothis, or whether this may not have been originally held at the period when the star was in opposition.

ARCHÆOLOGICAL INSTITUTE.

FEB. 5TH.—The Rev. J. F. Russell in the chair. The Rev. H. M. Scarth sent a paper "On an Inscribed Votive Tablet found at Binchester (the ancient Vinovium)." The tablet was erected to Æsculapius and Salus, and is dedicated by a certain physician, and the chief interest of the inscription consists in its being a further testimony to the fact that the Roman troops in Britain were supplied with medical officers, and it likewise tends to the presumption that the *ala* of the Vetonnes, or body of Spanish cavalry from the province of Salamanca, were stationed at Vinovium. The inscription is as follows:—

[AES]CVLAPIO .
[ET .] SALVTI .
[PRO . SALV]TE . ALAE . VET .
[TONVM .] C . R . M . AVRE .
[I . CRVSS]OCOMAS . ME .
[V . S .] L . M .

Mr. Scarth gave several other instances of Roman monuments erected either by or in commemoration of medical officers connected with the army in this country. As examples of the different ranks held by Roman military physicians, he instanced the titles "medici alarum," "medici cohortum," "medici legionum," and "medicus duplicarius triremis." The duties of the Prefectus Castrorum extended, according to Vegetius, over the sick soldiers and those physicians who had the care of them. Several inscriptions to soldiers of the Vettonian *ala* were also described. Mr. C. E. Keyser read a paper "On the recently discovered Mural Paintings at Patcham, near Brighton," in the course of which a new theory was adduced in explanation of the so-called "low side windows." Among the remarkable features of the interesting paintings in question were the thirty coats of whitewash with which they had been covered, and from beneath which they had been apparently satisfactorily disinterred. Mr. J. G. Waller spoke at some length on the definite laws which regulated paintings in churches, which laws were established as early as in the fifth century, and developed up to the time of the Reformation. With regard to the subject of "The Last Judgment," as represented at Patcham, the same general features occur in all such representations, but it was extremely difficult to say when the laws for this special subject were laid down. Mr. J. Neale and Mr. J. T. Micklethwaite spoke as to the means that had been employed to preserve the Patcham paintings. Among the antiquities exhibited was an embroidered pulpit cloth, formed of the orphreys and other portions of two copes from Woolchurch, Dorset, sent by Mr. E. A. Griffiths. Mr. Hartshorne exhibited a photograph of a sepulchral slab of a lady, lately found in Bangor Cathedral. The costume is of the middle of the fourteenth century, and the figure holds a *par precum*, or string of beads arranged in sets of seven, and having five circular brooches in immediate connection with them. Two pockets are shown in the front of the lady's long gown, which is fastened with innumerable buttons down to the feet. Mr. H. S. Harland sent a rubbing of the tympanum of the south door of Everton Church, Notts, a sculpture of the same character as that at Moccas, Herefordshire. The Rev. G. T. Harvey exhibited a leaden disc found at Oundle. Many other antiquities were exhibited.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

FEB. 4TH.—Mr. T. Morgan in the chair. Mr. R. Blair announced the discovery of 6,000 Roman coins near the station Hummum, on the line of the Great Roman wall between Newcastle and Carlisle. They are all of the later emperors and in capital preservation. Mr. Grover exhibited some remarkable prehistoric weapons found in England and Switzerland, and Mr. Cecil Brent some examples of so-called Rhodian glass of the fifteenth century, found in excavations in London. Mr. R. Smith described a gold ring found at Brancaster, and now in the collection of Mr. Fitch, of Norwich. It has two faces confronting one another, with the inscription "Vivas in Deo." Christian inscriptions of Roman date being so rare in England, much attention was given to this object, but it is most probably the work of the Gnostics rather than Christians, as was pointed out by Mr. Grover. Mr. Teniswood exhibited some remarkable designs from the little known corona of the cathedral of Aix-la-Chapelle, of twelfth century date, and of much interest from their elaborate workmanship and details of costume. Major Bates, in referring to Mr. Cope's recent paper on "Ancient Jade," stated that the natives of New Zealand held this material in high estimation not because of any religious belief, but because articles made of it were heirlooms among the principal chiefs. The first paper was by Mr. G. R. Wright, and was a description of the ancient frescoes recently discovered above the Norman chancel arch of Patcham Church. Mr. L. Brock considered the work late twelfth century work. The subject was the Day of Judgment, so usual in the position where found—over the chancel arches of our ancient churches. Mr. Patrick believed that this and similar works were tempera paintings rather than frescoes. See the report of the Archæological Institute. The second paper was on "Dogmore Pool, Cornwall," by Mr. J. Brent, and in the absence of the author ~~it~~ was read by Mr. Brock. The Arthurian legends were examined and commented on. The meagre size of the lake and its flat surroundings hardly justify Mr. Tennyson's description.

FEB. 18TH.—Mr. H. S. Cuming in the chair. It was announced that the fratry of Carlisle Cathedral was under restoration, and that it was proposed to obliterate the ancient appearance of the building by refacing it with new stone, and also to remove all works of later date than that of the main fabric. A resolution deprecating both these undesirable principles was carried. Mr. S. Stevens described some Roman relics found on the banks of the Loddon, in a district not remarkable for objects of this period. Mr. T. Wright exhibited a rubbing from an unused slab in Sedgebrook Church, Lincoln, the date of which Mr. de Gray Birch deciphered: it is 1394. Mr. Wright also described a curious MS., "The Voyage of Italy," which has been the property of the Grover family for many generations. It is of early seventeenth century date, and has many quaint descriptions of places and pieces of advice, among which "Avoid the three W's—Wine, Women, and Words," is not the least curious. Mr. Pinches read an elaborate paper "On the Terra-Cotta Tablets of Babylonia and Assyria," and illustrated his remarks by several specimens of the various classes which he deciphered to the meeting. After indicating that stone and bark of trees formed the first writing materials of most nations, he referred to the very early use of clay, at first baked and afterwards unbaked. Some instances of the use of silver records, which 800 years afterwards were transferred to clay, were named, and others in stone, which had been recovered with much later inscriptions. The earliest clay tablets are those known as "compacts," while others have clay cases with the inscriptions repeated on the outside. Some were in forms of cones, and placed in cavities of foundations of buildings. At a later period in Assyria the tablets were large, and kept like books on shelves. The "correspondent" tablets are of great interest. The "contract" tablets were filled with figures, and cannot be readily deciphered. The chairman read a paper on a portrait of Henry VI., painted on one of the panels of the rood screen of Eye Church. The figure has a nimbus, and is but little known. Mr. Brock called attention to the neglected condition of many similar figures in the Norfolk and Suffolk churches, many of which are of great antiquarian interest. A large number of copies of other figures by Mr. Watling were on the walls.

LINNEAN SOCIETY.

FEB. 5TH.—W. Carruthers, Esq., V.P., in the chair. Mr. C. Stewart showed a specimen of the intranuclear network of the vegetable cell from the ovary of *Hyacinthus Orientalis* under the microscope, and by diagrams elucidated its nature. Dr. F. Day exhibited samples of Salmonidæ, some of which had been reared under natural and others under unnatural conditions. A *Salmo fontinalis*, which had passed its existence in the Westminster Aquarium, had the head preternaturally elongated and a very narrow suboperculum; thus in striking contrast to examples reared from the same batch of imported eggs, and kept in a wild state in Cardiganshire. Mr. R. I. Lynch brought under notice pods of *Acacia homalophylla*, wherein each seed was attached by a very long and bright red funicle, which doubly folded on the sides of the seed. The funicle is supposed to be always detached with the seed, and from its brilliant colour to serve as an attraction to birds, and so assist in the dissemination of the plant. Mr. A. Hammond exhibited a larva of *Tanypus maculatus*. He mentioned that the coronet and appendages of the thoracic and anal regions had been said to be homologous with the respiratory organs of the larva and pupa of gnats, &c. This he doubted, inasmuch as the former originated from the ventral and not dorsal surface, as did the latter, and no tracheæ of any size could be traced in them. The two oval bodies in the thorax, De Geer's so-called "air reservoirs," he (Mr. Hammond) considers to be salivary glands, similar to those of the larva of the crane fly, previously described by him. Mr. C. B. Clarke then gave an oral *résumé* of the order Commelynaceæ, which order he had lately worked out for De Candolle's "Prodromus." He defined this order by the position of the embryo, as not surrounded by the albumen, but closely applied to the embryostega, which is always remote from the hilum. An important auxiliary character is that the three segments of the calyx are always imbricated, so that one is entirely outside the two others. Mr. Clarke divides the Commelynaceæ into three tribes: (1) Pollieæ; (2) Commelyneæ; and (3) Tradescantieæ, whereof there are 26 genera and 309 species. A remarkable feature of several species (*Aneilema versicolor*, &c.) is the change of colour of the petals from a bright yellow when fresh to a deep blue when dry. Afterwards the Secretary read a paper "On the Salmonidæ and other Fish introduced into New Zealand Waters," by Mr. H. M. Brewer. The author refers to ten fish, viz., Salmon, Californian Salmon, Trout, American Charr, Perch, Tench, Carp, Cat Fish, White Fish, and the Upukororo.

ZOOLOGICAL SOCIETY.

FEB. 3.—Prof. Flower, President, in the chair. Captain W. V. Legge exhibited and made remarks upon some specimens of the little ringed plovers of India and Ceylon. Letters and communications were read from Dr. G. Hartlaub, containing the description of a new species of heron obtained in Mohambo in Northern Madagascar, which he proposed to name *Ardea Rutenbergi*; by Mr. O. Thomas on a specimen of *Myoxus elegans*, Temminck, obtained by Mr. H. Pryer near Yokohama, Japan; from Mr. H. N. Moseley, containing the description of a new species of simple coral, which he proposed to call *Desmophyllum lamprosteichus*; by Prof. F. J. Bell on Palæolampus, a new species of irregular Echinoidea, which presented among others the following archaic points: (1) the rows of pores were completely parallel and extended regularly to the ambitus, (2) some of the pores exhibited an elongation indicating the appearance of the connecting groove, (3) the outer row of each pore-series was continued uninterruptedly to the actinistome, and (4) two of the ocular pores retained indications of their primitively double character; by Messrs. C. J. Danford and E. R. Alston "On the Mammals of Asia Minor," Part II., in which they added certain species to their former list, and described a new species of Vole under the name of *Arvicola Guentheri*; and by Mr. Sclater on a fifth collection of birds from Duke of York Island and its vicinity. Four species were described as new, and proposed to be called *Megalurus interscapularis*, *Pœcilodryas Æthiops*, *Munia melæna*, and *Rallus insignis*.

PHOTOGRAPHIC SOCIETY.

FEB. 10TH.—J. Glaisher, Esq., President, in the chair. Dr. Huggins read a paper "On the Photographic Spectra of Stars," describing the apparatus he had devised and the photographs taken upon gelatine emulsion dry plates, the results suggesting that these spectra indicated different ages of the stars. Captain Abney read a paper "On a Process for Printing by Development," using washed sensitivised paper, either plain, albuminised, or gelatinised, and a ferrous oxalate developer.

CHEMICAL SOCIETY.

FEB. 5TH.—Mr. Warren de la Rue, President, in the chair. It was announced that a ballot for the election of Fellows would be held at the next meeting (Feb. 19th). The following papers were read:—"Note on the Assumed Formation of Ozone by the Atmospheric Oxidation of Phosphorus," by Mr. C. T. Kingzett; "Contributions from the Laboratory of Tokio, Japan: II. On Persulphocyanite of Silver," by Mr. R. W. Atkinson; "On Methylated Dioxethyleramines," by Mr. H. F. Morley; "Note on Igasurin," by Mr. W. A. Shenstone; and "On some Reactions of Tertiary Isobutylic Iodide," by Mr. L. Dobbin.

FEB. 19TH.—Mr. Warren De La Rue, President, in the chair. The list of officers and council proposed by the Council for the ensuing year was read from the chair. The principal changes are:—President, H. E. Roscoe; Vice-Presidents, Warren De La Rue, J. Dewar, V. Harcourt, in the place of F. Field and H. E. Roscoe; other Members of the Council, C. Graham, H. M'Leod, E. J. Mills, J. M. Thomson, instead of A. H. Church, W. H. Hartley, and E. Riley, who retire. The President mentioned that a crystal had been prepared by Mr. Hannay; its angles, lustre, hardness, &c., were identical with those of the diamond; a similar crystal when burned was found to contain 97 per cent. of carbon; it was, therefore, to all intents and purposes, a diamond. The following paper was read:—"On the Production of Ozone during the Combustion of Coal Gas," by Mr. R. H. Ridout. Prof. M'Leod made some remarks in reply to a criticism of Mr. Kingzett as to the formation of ozone during the slow oxidation of phosphorus. In his opinion, while fully admitting the justice of Mr. Kingzett's criticism, the evidence was quite conclusive without the quantitative results. Mr. R. H. Ridout gave a short account of some new and improved laboratory appliances. Dr. Armstrong made some remarks on some recent researches on the so-called unsaturated compounds.

ASTRONOMICAL SOCIETY.

Feb. 13th.—Lord Lindsay, M.P., President, in the chair.—Capt. J. Steele and Mr. W. H. Bartlett were elected Fellows. The President mentioned that Volume XLI. of the *Memoirs*, upon 'Observations made during Total Solar Eclipses,' was now ready for distribution. The volume had occupied Mr. Ranyard nearly nine years in its preparation, and contains a discussion of observations made up to the total eclipse of April, 1875.—Portions of the Annual Report were read to the meeting. Thirty-one new Fellows and four Associates had been elected during the past year. Dr. Lamont, of Munich, was the only associate who had died, but amongst the Fellows the number of deaths was much greater than usual. Lives are given in the Annual Report of Mr. R. Farley, Sir R. Hill, the Rev. H. C. Key, Mr. S. C. Whitbread, Mr. J. E. Richard, Mr. I. Fletcher, Prof. Clifford, Mr. Drach, and Sir T. Maclear.—Eighteen minor planets had been discovered during the past year, mostly by Messrs. Peters and Palisa. Six comets have been observed during the past year, two of them known periodical comets, viz., Brorsen's comet and Tempel's periodical comet of 1867; the others are believed to be new comets.—The meeting then proceeded to the ballot for the election of Officers and Council for the ensuing year, and the following gentlemen were declared to be elected: President, J. R. Hind; Vice-Presidents, J. C. Adams, Sir G. B. Airy, A. Cayley, and E. Dunkin; Treasurer, F. Barrow; Secretaries, W. H. M. Christie and J. W. L. Glaisher; Foreign Secretary, Lord Lindsay; Council, Sir E. Beckett, A. A. Common, W. Huggins, E. B. Knobel, G. Knott, W. Lassell, A. Marth, E. Neison, A. C. Ranyard, H. J. S. Smith, E. J. Stone, and Major J. L. Tupman.

ASIATIC SOCIETY.

Feb. 16.—Sir H. C. Rawlinson, President, in the chair.—Major-General H. C. Johnstone, Col. M. R. Haig, and Mr. T. R. Gill were elected Resident Members.—Prof. F. Max Müller read a paper 'On the Discovery of Sanskrit Texts in Japan.' It is a well-known fact—well known, at least, to all students of the history of Buddhism—that, beginning almost with the beginning of our era, there has been a constant flow of Sanskrit MSS. from India to China. The earliest translators of Buddhist texts in China were those who worked under the Emperor Ming-ti, viz., Kâsyapa Matanga and Tsu-fa-lan. Their most important works are the 'Sûtra of the Forty-two Sections,' and translations of the 'Dasabhûmi-Sûtra' and the 'Lalita Vistara,' the legendary 'Life of Buddha.' Considering that these works would not have been translated unless they had acquired in India a kind of canonical authority, these translations themselves enable Buddhist scholars to assign to the Sanskrit originals, so far as they agree with the Chinese translations, at all events an ante-Christian date, a point of great importance in a comparative study of the ancient religions of the world. In 150 A.D. another famous translator is mentioned, An-shi-kau, a native of Eastern Persia or Parthia, the son of a king, who, like Buddha, made himself a mendicant and travelled to China. Mr. Wylie supposes An-sik to represent Arsak, and takes him for a son of one of the Arsacide kings of Persia. In about 170 A.D. Chi-tsin is mentioned as the translator of the 'Nirvâna-Sûtra,' and in 250 Chi-meng translated the 'Rules of the Priesthood' from a MS. said to have come from the city of Pâtali-putra, or Patna. In 260 A.D. Dharmaraksha made a large collection of Buddhist and Brahmanic MSS., and with the help of other Shamans he is said to have translated no less than 165 texts. This brings us to the time of the Emperor Yao-hing (397-415), who secured the services of the learned translator Kumâragîva, and sent Fa-Hian to India to India to collect MSS. In 460 A.D. we read of five Buddhists arriving in China from Ceylon by way of Tibet. These, no doubt, brought Pâli MSS. with them. Bodhidharma, too, the twenty-eighth Buddhist patriarch, came from the South in 526 A.D., though not from Ceylon. In 518 the famous traveller Sun-Yun was sent by the Queen of Wai country in search of Buddhist books, and we gather from his 'Travels,' translated by Mr. Beal, that after three years spent in India he returned to China with 175 volumes. During the Siu dynasty, 589-619, the number of Buddhist books translated into Chinese is said to have risen to 1,950. That number was considerably increased afterwards, particulary by Buddhist pilgrim Hiouan-Thsang, who is said to have translated 740 works, forming 1,335 books. With these facts before us the question naturally arises, What has become of all these MSS.? We have the Chinese translations, then why should their originals not have been preserved, or, if not the original MSS., at least copies of them? The late Prof. H. H. Wilson was so much struck with the importance of discovering the traces of that lost tribe of Sanskrit MSS., that he used all his influence to set on foot an inquiry, in which he had the energetic assistance of Sir John Bowring, the English Minister in China. Letters of inquiry were sent to the authorities of monasteries and temples, catalogues of libraries were examined, but all ended in disappointment. No Sanskrit MSS. were found. The whole correspondence that passed between Prof. H. H. Wilson, Sir John Bowring, and Dr. Edkins was printed at the time in the *Journal* of the Royal Asiatic Society, and then the matter dropped. Prof. Max Müller has for years impressed any of his friends who went to China with the necessity of further inquiries, and some years ago a book that Dr. Edkins sent him from Japan induced him to extend these inquiries to that country also. That book, which was published in Japan, contained a glossary of Chinese words, with their equivalents in Sanskrit, and transliterations of the Sanskrit words in Japanese. The Sanskrit words were represented in an alphabet closely resembling the old Nepalese alphabet, though disguised in a flowery style that made the Sanskrit letters look almost like Chinese. The existence of such a book proved that there must have been a time when it was useful to students in Japan, *i.e.*, that there must have been a time when the Buddhist priests in Japan were able to read Sanskrit. By a most fortunate combination of circumstances, at the very time that Prof. Max Müller was working at the Sinico-Sanskrit Glossary, received from Japan, a Buddhist priest, Mr. Bunyiu Nanjio, was sent to him in order to learn Sanskrit at Oxford, and to study the sacred writings of Buddhism in their original languages, Sanskrit and Pali. From the very first Prof. Max Müller tried, through his pupil, who after a time was joined by a second, Mr. Kasawara, to gain information about Sanskrit texts in Japan, and after waiting for some time, he received last December a Japanese Book, sent to him by a native scholar, Shuntai Ishikawa. It was a Sanskrit text, written in the same old Nepalese alphabet, each word transliterated with Japanese letters, and translated into Chinese. Shuntai Ishikawa requested Prof. Max Müller to read the Sanskrit text, correct it, and send it back to Japan. Here, then, was the unexpected reward of long-continued research, and there is every hope that where one Sanskrit text has been discovered, others may follow. Prof. Max Müller exhibited a corrected text of the Sanskrit original, and a literal translation with notes. He proved that the Sanskrit text, the Sukhavatî-vyûha, was an old text, and not an abbreviation made in China or Japan. There is another well-known Sûtra of the same name, of which several MSS. exist in England and France, and which has been translated into Chinese and Tibetan. This is one of those lengthy, tedious Sûtras which Burnouf has well characterized in his 'Introduction à l'Histoire du Buddhisme.' These lengthy Sûtras, however, presuppose the existence of simple Sûtras, and it is one of these simple Sûtras that has been recovered in Japan. It contains a description of the Paradise of Amitâbha Buddha, and belongs to the Mahâyâna school, which in Japan has well-nigh obliterated the original pure and simple teaching of Buddha Sâkya Muni. It differs, however, from other simple Sûtras by introducing Bodhisattvas as followers of Buddha, their presence being, according to Burnouf's hypothesis, a distinguishing feature of the large or Vaipulya Sûtras. That the Sanskrit text now discovered in Japan is an ancient text was proved by showing that it must have been the original from which a Chinese translation was made by Kumâragîva about 400 A.D., while another Chinese translation, either of the simple or the the lengthy text, is mentioned as early as the second century. The Chinese translation of the short Sanskrit text has been translated into English by Mr. Beal in his 'Catena,' and a comparison of that rendering with the original Sanskrit shows how cautiously we ought to use the Chinese translations of Sanskrit books. If more of these original Sanskrit texts could be recovered in Japan or in China—for there is no reason yet to give up all hope—a new start would be made in the study of Buddhism, more particularly in the study of what is called the Buddhism of the North. The Japanese Minister, his Excellency Mori Arinori, who was present at the meeting, promised to lend every assistance in his power to recover, if possible, some more of these ancient Sanskrit texts.—Mr. J. W. Redhouse read a paper 'On the Identification of the "False Dawn" of the Moslims with the "Zodiacal Light" of Europeans,' and quoted largely from the letters he had received from different astronomers all over the world fully confirming his views.

STATISTICAL SOCIETY.

Feb. 17th.—Sir R. W. Rawson in the chair.—The following new members were elected: Messrs. A. C. Tupp, P. H. Fowell-Watts, M. G. Mulhall, W. Parkin, T. E. A. Gwynne, J. Smith, I. L. Bell, G. A. Oakeshott, W. A. Bowser, and Hon. F. Strutt.—A paper, by Mr. T. A. Welton, 'On Certain Changes in the English Rates of Mortality,' was read and discussed.

MICROSCOPICAL SOCIETY.

Feb. 11th.—Anniversary Meeting,—Dr. Beale, President, in the chair.—Twelve gentlemen were elected or nominated for fellowship. The Reports of the Council and Treasurer showed that the condition of the Society was highly satisfactory, an exceptionally large number of new Fellows having been elected last year, and the revenue having increased by more than £200. The following are the Officers and Council for the ensuing year: President, Dr. L. S. Beale; Vice-Presidents, Dr. R. Braithwaite, Dr. W. B. Carpenter, Prof. P. M. Duncan, and H. J. Slack; Treasurer, J. W. Stephenson; Secretaries, C. Stewart and F. Crisp; Members of Council, Dr. W. J. Gray, Dr. J. Matthews, J. Badcock, W. A. Bevington, A. E. Durham, C. J. Fox, J. Glaisher, A. de

Souza Guimaraens, A. D. Michael, J. Millar, F. H. Ward, and T. C. White. The President delivered his annual address, in which, after referring to the gratifying position of the Society and the great improvement that had taken place in the *Journal*, he discussed the nature of the changes occurring in living matter. Facts and arguments were adduced against the doctrine generally entertained concerning the physical nature of vital phenomena, many of Dr. Allman's statements in his British Association Address were called in question, and serious objections raised to the acceptance of *Bathybius Haeckelii*, in the existence of which Dr. Beale did not believe.

SOCIETY OF ARTS.

FEB. 12TH.—Mr. H. Doulton in the chair. A paper 'On Gas Furnaces and Kilns for Burning Pottery' was read by Mr. H. Guthrie before the Section of Applied Chemistry and Physics.

FEB. 16TH.—The third lecture of his course 'On the Manufacture of India-Rubber and Gutta-Percha' was delivered by Mr. T. Bolas.

FEB. 17TH.—Dr. B. W. Richardson in the chair. A paper 'On the Principal Causes of Diseases in Tropical Countries Scientifically Considered' was read before the Foreign and Colonial Section by Mr. A. W. Mitchinson.

FEB. 18TH.—Field-Marshall Lord Strathnairn in the chair. Six candidates were proposed for election as Members. A paper 'On the Euphrates Valley Railway' was read by Mr. W. P. Andrew.

FEB. 23RD.—Mr. T. Bolas delivered the fourth lecture of his course "On the Manufacture of India-Rubber and Gutta-Percha."

FEB. 24TH.—Sir C. Nicholson, Bart., in the chair. A paper entitled "Views of Colonisation" was read before the Foreign and Colonial Section by Mr. W. Forster.

FEB. 25TH.—J. Stevenson, Esq., M.P., in the chair. Seven candidates were proposed for election as members. A paper "On the Noxious Gases Bill" was read by Mr. E. K. Muspratt.

MATHEMATICAL SOCIETY.

FEB. 12TH.—Mr. C. W. Merrifield, President, in the chair. Mr. D. Edwardes was elected a member, and subsequently admitted into the Society. The following communications were made: 'Geometrical Notes,' by Prof. H. J. Smith; 'On the reflections of Vibrations at the Confines of Two Media between which the Transition is gradual,' and 'On the Stability or Instability of Certain Fluid Motions,' by Lord Rayleigh, and 'The Calculus of Equivalent Statements' (fourth note), by Mr. H. M'Coll.

ANTHROPOLOGICAL INSTITUTE.

FEB. 10TH.—F. Galton, Esq., F.P., in the chair.—The following new Members were announced: Messrs. T. Hodgkin, A. Tucker, H. C. Stevens, J. A. Farrer, B. M. Wright, T. W. W. Robinson, and W. D. Gooch. Dr. E. Holub delivered an address on the central South African tribes from the south coast to the Zambesi. Dr. Holub had found along the south coast traces of tribes which do not now exist, heaps of burned bones of wild animals, none of domestic animals, and broken shells. Other tribes once belonged to the regions between the Limpopo and Zambesi, and here were found ruins of towns, generally in the vicinity of mines, especially gold mines. The houses were of stone, on the top of mountains, put together without any cement, but so well fitted that they have stood for hundreds of years. Some of the ruins were formed of blocks of granite in the shape of bricks. The tops of small hills were fortified in this way, with openings in the walls. The remains probably belonged to those who inhabited the ancient empire of Monopotapa, mentioned by the Dutch and Portuguese traders as existing two hundred years ago. When a country is conquered it is the custom to kill all the male population, take the women and children prisoners, and educate the latter as warriors of the victorious tribe. In this way whole tribes have ceased to exist in South Africa; even since Livingstone's time a powerful tribe of Basutos, on the Upper Zambesi, named the Makololas, has been almost exterminated. Dr. Holub divided the living tribes into three races, the Bushmen, the Hottentots, and the Bantus. He found a link between the Bushmen and the Bantu family, and between the Bushmen and the negroes, but not between the Hottentots and the Bantus. The Bushmen are rapidly dying out, and are utterly incapable of civilization. They use stone weapons and poisoned arrows, but the bows and arrows are of very simple construction compared with those in use among the nations of North and South America. The Hottentot race is divided into three tribes, the real Hottentots, the Griquas, and the Koranas. No South African tribe has taken so eagerly to the vices of civilization as the Hottentot race. The Bechuanas observe many of the virtues of the white man, but the Hottentot adopts only his vices; drunkenness is the chief cause of their dying out. They do not seem to have any religion, but a kind of freemasonry exists among them, the outward and visible sign of which is three cuts on the chest, made with appropriate ceremony.

PHYSICAL SOCIETY.

FEB. 14TH.—Annual General Meeting.—Prof. W. G. Adams, President, in the chair. The President read the Report for the past year, which showed that the position and prospects of the Society were in every way satisfactory, and that more papers had been read during the past twelve months than in any previous year.—Sir W. Thomson was chosen President for the ensuing year, and various other officers were elected. The following new Members were elected:—Messrs. Mollison, Hare, J. C. Lenis, Miss Caroline Martineau, and Senor Roig y Torres, of Barcelona. The following papers were read: 'On a Quartz and Iceland Spar Spectroscope corrected for Chromatic Aberration by Dr. W. H. Stone; 'On an Automatic Switch for Telephone Circuits,' by Mr. W. Wynne, and on their 'New Theory of Terrestrial Magnetism,' by Profs. Ayrton and Perry.

INSTITUTION OF CIVIL ENGINEERS.

FEB. 10TH.—Mr. W. H. Barlow, President, in the chair. The paper read was "On Iron and Steel at Low Temperatures," by Mr. J. J. Webster.

FEB. 24TH.—Mr. Brunlees, V.P., in the chair. The paper read was "On the Use of Asphalte and Mineral Bitumen in Engineering Works," by Mr. W. H. Delano.

FOLK-LORE SOCIETY.

FEB. 10TH.—Mr. H. C. Coote in the chair. A paper was read by Mr. J. Fenton "On Biographical Myths, illustrated from the Lives of Buddha and Mohammed." The myths surrounding the lives of great men have usually been passed over by historians as unworthy of attention. But if the law of the accretion of myths be observed, the myths become a valuable aid in reconstructing history. The period of expectation which precedes the coming of a great man produces an ideal personage, answering to popular aspirations, around whom all sorts of myths congregate. Hence a great man is viewed through a sort of mental lens, formed of the ideal he realises. But at the same time he modifies the ideal, because his actual life differs from it. Finally, therefore, he is viewed as himself idealised. The result of this upon the myths of the ideal is that those which cannot conform to the realisation fall away, and others are modified till they do so conform. Hence, knowing the original myth, we know the ideal; knowing its later form, we know the influence of the historic personage, and can estimate the influence of one upon the other. As a rule, myths are found to cluster round four periods of life: birth, early manhood, mature manhood, and death. In illustration it was shown how the stories of Buddha's birth, awakenment, perfect enlightenment, and death ran parallel to the birth, purification, ascent into heaven, and death of Mohammed, the motives being alike in each series, but the working out dependent upon the historic factors in each. The transformation which myths undergo was illustrated from the cleansing of Mohammed's heart and the birth of Yasada, which were shown to be popular stories moulded into accordance with historic fact. Mr. Gomme read some "Notes on Primitive Marriage Customs," pointing out that the story of Catskin probably contained a survival of the form of bride-capture, and giving some further notices of old wedding customs. Messrs. Micklethwaite, Nutt, Millman, Conway, Vaux, the Rev. J. Long, and the Rev. J. G. Fleay took part in the discussion on the papers.

NUMISMATIC SOCIETY.

FEB. 19TH.—J. Evans, Esq., President, in the chair. The following gentlemen were elected members:—Messrs. N. Heywood, W. Theobald, H. E. Williams, and W. W. Wroth. Mr. Evans exhibited a three-farthing piece of Elizabeth, dated 1573, with the acorn mint-mark. The Rev. Canon Pownall exhibited an impression of a gold triens of the Merovingian period, with the legend DORKV (?) on the observe and a cross patée on the reverse. Mr. Henfrey sent for exhibition a drawing of an Anglo-Saxon sceatta found near Eastbourne, similar to Ruding, Plate I., 35. Mr. R. Hoblyn exhibited specimens of the copper coinage of Sarawak, consisting of the cent, half cent, and quarter cent, 1863, of Sir J. Brooke, Rajah, also of the same denominations of 1870 and 1879 of C. J. Brooke, Rajah. Mr. Hoblyn likewise showed proofs in silver of the gun-metal crown of James II. and of the white-metal crown with the inscribed edge of the same monarch. The Rev. Canon Greenwell read a paper on some rare and beautiful Greek coins in his own cabinet. Among them were a tetradrachm of the town of Eryx in Sicily, an octadrachm of Abdera, a magnificent tetradrachm of Amphipolis, and a remarkable Cyzicene stater bearing an undoubted portrait. The Rev. Canon Pownall read a paper "On Anglo-Saxon Coins struck at Stafford."

ENTOMOLOGICAL SOCIETY.

FEB. 4TH.—J. W. Dunning, Esq., V.P., in the chair. Mr. P. F. Copland was elected a member, and Messrs. J. B. Bridgman and P. Cowell subscribers. Mr. Stainton exhibited, on behalf of Mr. Grigg, a specimen of *Heliothis scutosa*, captured near Weston-super-Mare. Mr. Pascoe exhibited a specimen of the "fire-fly" of the Amazon Valley, *Aspisoma lineatum*. It has the usual intermittent light flashing at intervals of two seconds, but Mr. Pascoe believed it was capable of keeping back the light for an indefinite time. The Rev. H. S. Gorham objected to the term "fire-fly" being applied indiscriminately to all luminous insects, there being many luminous Coleoptera, and as regards the flashing of the light from these insects he considered it was often simply due to the creatures crawling over leaves and herbage, and thus exposing the ventral surface only at times. Mr. Meldola remarked that some years ago he had examined the spectrum of the glow-worm and found that it was continuous, being rich in green and blue rays, and comparatively poor in red and yellow. Mr. Pascoe also exhibited the two sexes of *Isopogon Hottentotus*, a dipterous insect which was reported as hitherto unrecorded in this country, and remarked upon the gregarious habits of this species compared with those of others of the family. The Secretary exhibited, on behalf of Mr. G. Francis, specimens of a South Australian moth (Anapæa, Sp.) which feeds on the native Eucalypti. Mr. Swinton forwarded a letter calling in question the specific distinctness of *Acronycta Psi* and *A. tridens*, considered as separate species by Mr. Butler in a recent communication. Mr. Meldola read a note "On the Protective Attitude of the Caterpillar of the Lobster Moth," extracted from *Kosmos*, November, 1879. The following papers were also communicated :—"Materials for a Revision of the Lampyridæ," Part II., by the Rev. H. S. Gorham ; and "On some Coleoptera from the Hawaiian Islands," by Dr. Sharp.

SOCIETY OF PUBLIC ANALYSTS.

At the annual meeting of this Society, held on the 15th January, at Burlington House, Piccadilly, the president, Dr. Muter, in the chair, the minutes of the previous meeting were read and confirmed.

The President delivered his annual address as follows :—Gentlemen, it is customary for the retiring president of our society to say a few words of farewell, coupling them with remarks upon the general position of the society and the working of the act of parliament under which we all hold office. I am glad to say that the past year, so unfortunate to many both at home and abroad, has been comparatively gentle to us, seeing that we have only lost two members by death, namely, Messrs. H. Goode and J. Whitla, with neither of whom had I the pleasure of a personal acquaintance, but I have understood from those who had that they were men making their mark on the sands of time, now alas, too soon washed out by the tide of eternity. During the year one member has resigned, and two have been struck off by the council for non-payment of their fees, but to make up for this loss five new members have been elected, thus keeping "our balance true" up to the moment. So that we stand now with 90 members and 12 associates, being a total gain of two in the last twelve months. We are also more fully endowed with that very necessary article called "worldly dross" by those who have not got it, seeing that although our payments have increased by £18 on account of the *Analyst*, we have still a balance at our bankers which is £2 better than last year. Gentlemen, our society is not and never can be large, because it is limited to a certain class, and owing to the vast preponderance of country members our meetings may not be very numerous, but still we have a distinct *raison d'être*, and we carry that out to the letter. You will excuse me imitating Mr. Silas Wegg and "dropping into poetry" unconsciously, but after all it is something to boast of that we do act up to our aspirations, which is more than can be said of all other scientific associations. We do not pretend to elevate the morals of our members and then find ourselves helpless when cases arise requiring such elevation, neither do we pretend to raise the fees receivable for work done and then find that we have upon our council some most notorious offenders in that respect, nor do we get up discussions on subjects specially the province of other societies, and end them in smoke. What we do profess we carry out, namely, to improve the process of analysis in all matters relating to food. Germany is and has always been looked up to as the foster-mother of general chemical discoveries, but for research in our special subjects we must look at home ; and everyone must admit that Great Britain is up to the present the source of special food research, and that all which has been done has been mainly attained by the members of the Society of Public Analysts. During the last year we have had either read here or published in our journal (the *Analyst*) no less than forty-one memoirs relating to our branch of the chemical profession, and that, remember, all carried out not by wealthy *dilletanti* or men receiving grants from research funds, but by persons daily and actively engaged in carrying out the complex and tedious duties thrown upon them by an act of parliament. Let us, gentlemen, strive to keep the position so nobly attained, and let us one and all resolve to do more and more every year in the grand cause of the advancement of our art, so that we may keep pace with our enemies, the adulterators, and let the public of Great Britain have that most precious of boons, namely, pure food and drugs. As regards the act and its working we must congratulate ourselves that, oiled by the good lubricator, time, our wheels move smoother every year. More and more our processes and modes of interpretation of results continually receive general acceptance, and closer do we and our Appeal Court at Somerset House draw to each other. I believe sincerely that Mr. Bell and his colleagues try most earnestly to elicit the truth, and were they only freed from the absurd restriction which prevents their coming amongst us and letting us know their standards and experimental results, there would hardly ever be the difference of a decimal point between our conclusions and theirs. We must, however, trust to time, and I can only hope the day is not far distant when the heads of the Somerset House Laboratory will be found enrolled among us, and helping as we do to disseminate the knowledge of food analysis, instead of being compelled to keep their results locked up through a piece of Government red tapeism. The amended act of last session has proved a great public good in the case of peripatetic vendors of food, who were before enabled to carry on, without fear, the most barefaced schemes of adulteration ; and the recent decision of the High Court to the effect that if a man asks for an article and pays the full price for it he is distinctly entitled to receive that article in a state of purity, notwithstanding any declaration or notice to the contrary, is a distinct advance in equity in the interests of the public. Gentlemen, with these few words I will bid you *adieu*, hoping that we may all meet again at our next anniversary improved in knowledge and with the full consciousness that we have each given our stone to the grand cairn of the science of food analysis now being erected in our midst, so that our successors in the next generation may have reason to be thankful for the establishment of the Society of Public Analysts.

Mr. Allen proposed a vote of thanks to the president for his address, and hoped that it would be published not only in the *Analyst* but in other journals, as it showed what a large amount of real scientific work public analysts had done within a very short time .

Dr. Dupré, in seconding the vote, expressed a similar hope, and said that if their fellow chemists in England once became aware of the good work they were doing, the society would rise considerably in their estimation. He took the opportunity of saying that he thought there should be a little more *esprit de corps* among the members, which was one of the greatest reasons for establishing the society. He also said that as no analyst could pretend to know everything, it would be very wise if a member, when he had an article with which he was little acquainted, would write to the secretaries, who would always know the best member to give any required information.

The proposal having been unanimously agreed to, Dr. Muter returned thanks.

The President proposed that the thanks of the society be given to the council of the Chemical Society for the use of their rooms for meetings, which was unanimously agreed to.

The President proposed a vote of thanks to the members of council for their attention to the business of the society during the past year, which was also agreed to.

The President proposed a vote of thanks to the secretaries, Messrs. Heisch and Wigner, for their services during the past year, which was also agreed to.

Mr. Angell and Mr. West-Knights were appointed scrutineers to examine the voting papers for the election of officers and council, and they reported that the following were elected :—President : J. Muter, Ph.D., M.A., F.C.S. Vice-Presidents : A. Dupre, Ph.D., F.R.S., F.C.S. ; J. W. Tripe, M.D. ; A. Wynter Blyth, M.R.C.S., F.C.S. Treasurer : C. W. Heaton, F.C.S. Hon. Secretaries : Charles Heisch, F.C.S. ; G. W. Wigner, F.C.S. Other Members of Council : J. Carter Bell, F.C.S. ; J. Campbell Brown, D.Sc., F.C.S. ; C. A. Cameron, M.D., F.R.C.S. ; Bernard Dyer, F.C.S. ; Otto Hehner, F.C.S. ; W. Morgan, Ph.D., F.C.S. ; W. Wallace, Ph.D., F.C.S.

The scrutineers also reported that Professor C. R. C. Tichborne, Ph.D., F.C.S., public analyst for Longford County, and President of the Irish Pharmaceutical Society, was elected as a member. Mr. T. P. Bruce Warren, analytical chemist, was proposed as a member, and Mr. L. Stansell, assistant to Mr. C. H. Piesse, as an associate. Mr. Wigner read a paper by himself and Professor Church "On Two Ancient Samples of Butter." A paper by Mr. Carter Bell, "On the Composition of Unfermented Wines of Commerce," and one by Mr. W. M. Hamlet, "On the Estimation of Fat in Milk," were also read.

After the meeting the members dined at the Café Royal, and passed a pleasant evening together.

THE PURIFICATION OF GAS.

By Harry Edward Jones, M. Inst. C.E.

In dealing with the general subject, the author placed the purification of bisulphide of carbon in the foreground. The late Dr. Letheby in 1860 was responsible for the introduction into an Act of Parliament of a limitation to 20 grains of this impurity per 100 cubic feet of gas. Until the year 1866 no such limitation had been put upon companies outside the metropolis, and since then it had only been imposed in important towns. Such limitations were nowhere enforced or respected. Dr. Letheby had an opinion that it was only necessary to resort to the exclusive use of lime as a purifying material ; nevertheless it was unsuccessful when adopted in the works of the late Ratcliff Gas Company, an average for two years (1875-6) giving 28 grains per 100 cubic feet. In January, 1872, the Gas Referees reported the impossibility of fixing a limit. In 1877 the failure of the simple lime process led to the adoption of a different plan ; the carbonic acid was carefully eliminated. Success was, however, only occasionally attained, and the condition of the gas at the outlet of each purifier in the series was in consequence carefully tested and recorded day by day. These tests would have been a formidable business but for the introduction at that time of Mr. A. Vernon-Harcourt's colour tests. It was found that though carbonic acid was never allowed to pass the first purifier of a set of three vessels worked consecutively, it was only possible to keep the sulphur low when the third purifier was receiving a considerable quantity of sulphuretted hydrogen. Further, that so soon as the first vessel was taken off for the necessary replenishing, the sulphur rose many grains, and did not fall until the replenished purifier had been put to work again as the third vessel, and its contents had received more sulphuretted hydrogen. This action was illustrated by a table and diagram, as was also the action of a series of four lime purifiers. The advantage of further carbonating the lime on works which were closely surrounded by dwelling houses led to the adoption of the Beckton system. As it became unmistakable that sulphuretted hydrogen was mischievous when in excess, arrangements were made for abstracting it as it left the carbonic-acid system of purifiers by interposing oxide of iron. This was carried out with marked improvement, and the effective life of the sulphide of lime was much prolonged. In practice, both for the relief of back-pressure and for facility in renewing a sulphide of lime purifier, the carbonic-acid set of purifiers should yield the following results:—

	Crude gas.	A	B	C	D	
Sulphur . . .	40	52	45	30	28	Grains per 100 cubic feet.
Carbonic acid	410	300	40	—	—	
Sulphuretted hydrogen . .	800	900	400	—	—	

In this state of things the sulphur was generally 25 per cent. below that in the crude gas.

There was great advantage in exposing the material in the sulphide of lime purifiers to a current of air. Two purifiers at the Wapping Works of the Commercial Gas Company, which had become ineffective, were opened, the lime examined, stirred up, and put back, and they afterwards worked for nine and eight months respectively, and did tenfold more work than previously. The prejudicial effect of cold in the reduction of sulphur in the carbonic acid system of purifiers, and the beneficial effect of the application of heat from the exhaust steam of an engine, were then referred to. No advance had been made in the direction of purifying in closed vessels with liquid agents. Mr. G. T. Livesey had succeeded in eliminating the carbonic acid to 0·5 per cent. in volume by the use of rough caustic ammonia liquor. The tar should be separated from the gas immediately on leaving the hydraulic main. The author allowed the gas to leave the condensers in summer at no higher temperature than that of the atmosphere, and in winter than 40° Fahrenheit; in the former case the scrubbers usually reduced the gas to the temperature of 55°, and in the latter raised it to 45°. From the author's practice with water condensers he had found in one type that 1000 cubic feet per diem could be treated by 0·5 square foot of water. The result of condensation on the quality of the gas was then stated.

The purification of crude gas from ammonia proper was next referred to. The process was easy. The essentials were contact with extended superficies of water, or such concentrated intimacy as involved frictional resistance to the gas, and the ultimate exposure of the gas to pure water. No sooner was lime substituted for oxide of iron in the scrubbers than ammonia appeared in the clean gas; this had been lessened by the addition of oxide of iron catch purifiers, and removed by a small quantity of sulphuric acid and sawdust in the last catch purifier. The cost of ammonia purification was very small, the particulars of which were stated.

Sulphuretted hydrogen was easily removed by lime, oxide of iron, peroxide of manganese, and sulphate of iron. Of these purifiers lime was the best, and oxide of iron the cheapest and least offensive. Oxide of iron, sulphate of iron, and manganese converted the sulphuretted hydrogen on exposure to the air into free sulphur, becoming oxides again, and being, as it was called, revivified.

[Abstract of paper recently read at the Institution of Civil Engineers.]

Mr. Albert Clunan, of Brooklyn, N.Y., has invented an improved device for connecting the ends of leather, rubber, canvas, and other belt traces for harness and other bands and straps. It consists in combining a plate with a bar bent, threaded, and provided with an end nut.

AMERICAN PATENT LAW.

We quote the following from the *Scientific American* as showing, that although in many respects the Patent Law of the United States is far superior to our own, yet it has some points in which it is not desirable we should imitate it whenever we can make up our minds to reform the law:—

In the application for patent for vegetable sprout killer by Francis B. Rodgers, filed January 2nd, 1878, the decision of the examiner denying the patent has beeu overruled by the Board of Appeals. Applicant requests the allowance of the patent by the examiner (unless the utility of the patent is denied) in accordance with the decision of the examiners-in-chief.

The application relates to a compound or mixture for the destruction of vegetable life.

One of the grounds upon which the examiner rejected the application was that the mixture was a mere aggregation having no functions differing from those of its several ingredients. The applicant insisted that the compound operated more rapidly and effectually than either of its elements, The examiners-in-chief decided, on appeal, that if the mixture described operated more effectually and rapidly, and was more convenient in use, than its elements, the applicant was entitled to a monopoly of his new compound; but in their decision they stated that they were not informed on this point, and suggested that the applicant should be permitted to file affidavits, under Rule 31, in case the examiner should traverse his assertion that the mixture operated as above stated. Thereupon the applicant requested the allowance of the patent by the examiner (unless the utility of the patent was denied), in accordance with the decision of the examiners-in-chief.

The examiner replied that he did not deny the usefulness or operativeness of the mixture, but denied its patentability.

The applicant appealed to the Commissioner because, as he alleged, the examiner ignored the decision of the Examiners-in-chief; and he asked that the Examiner might be instructed in accordance with that decision.

The commissioner held that, inasmuch as the examiners-in-chief had decided that if the mixture was operative, as claimed, it was patentable in favour of the applicant, although they had not decided whether it was or was not so operative, their decision was obligatory upon the primary examiner, and that it was therefore the duty of the primary examiner, if he did not deny that the compound operated as the applicant claimed, to pass the case to issue; thereupon the appplicant requested that the primary examiner, inas much as he did not deny the operativeness of the invention, should, in obedience to the decision of the commissioner, pass the case to issue without further delay.

The examiner replied that the commissioner's decision was that he should pass the case to issue if he did not deny that the mixture operated more effectually and rapidly than any of its elements; and that, while he did not deny the operativeness of the mixture, he did not deny that it acted more effectually than its component parts. And he added that, while the suggestion of the examiners-in-chief that the applicant should be permitted to submit affidavits would have been consistent with the rules if the examiner had denied the operativeness or usefulness of the compound, nevertheless, inasmuch as he did not deny its operativeness or usefulness, but only denied that it would act more effectually or rapidly or conveniently than any of its elements, affidavits were expressly prohibited by the last clause of Rule 31, in which it it is provided that "affidavits in support of applications will not be received at any stage of the examination unless the office denies that the invention is operative or useful." Upon this action of the examiner the present motion for the transfer of the case to another division is based.

This motion cannot be granted. The primary examiner has not disregarded the decision of the commissioner, nor has he disobeyed the decision of the Board of Examiners-in-Chief; and, while he has declined to comply with their suggestion that applicant should be permitted to submit affidavits in the case, he has done so in the belief that this course was forbidden by the rules of the office. I am not prepared to say that this impression was incorrect.

But I see no good why the applicant should not be permitted, if he can do so, to show that this mixture acts more rapidly and more effectually than the elements of which it is composed, and is more conveniently used. I think that, under Section 483 of the Revised Statutes, I have authority by an order made with the approval of the secretary to authorise him to introduce such affidavits.

It is accordingly ordered that the applicant be permitted, within sixty days after the date of this order, to submit affidavits for the purpose of showing that his compound or mixture operates more effectually or rapidly and is more convenient in use than any of the substances of which it is compounded.

The relief demanded by the applicant is denied.

[Approved by the secretary.]

An undue zeal for the observance of forms and ceremonies is apt to make the ablest officials lose sight of the main object for which they are individually housed in the Patent Office, and for which the patent laws were enacted, to wit: the promotion of the useful arts by the grant of patents to authors and inventors. In times past some of the Commissioners and some examiners seemed to labour under the mistaken notion that the chief purpose of their official life was the opposing of inventors, the placing of obstacles in their way, and preventing the grant of patents.

The foregoing case illustrates our meaning: The examiner in the first place appears to have wrongfully denied the patent. The applicant was then put to the expense of an appeal to the Board of Examiners, who practically decided that a patent should be granted. But the examiner then holds back the patent on a technicality; the applicant is then put to the further expense of appealing to the commissioner in person, who supports the little point raised; which now subjects the inventor to further delays and costs in getting up expert testimony. All the trouble to all the parties concerned would have been avoided had the examiner in the first instance simply issued the patent.

We doubt, says the *Scientific American*, whether there is any instance where a Patent Office mistake made in favour of the inventor ever hurt the examiner, the commissioner, the Secretary of the Interior, or any other official. On the other hand such wrangles as the foregoing are always unprofitable, and do them little credit.

An improvement in sleeping car berths has been patented by Mr. Moritz Leiner, of New York city, N.Y. The object of this invention is to furnish an attachment for car and steamboat berths to facilitate entering and leaving the berths, and to prevent occupants of berths from falling or being thrown out. It consists in providing car and steamboat berths with ladders so constructed as to promote the convenience of passengers in entering and leaving the berths, and as guards to prevent the occupants of the berths from falling or being thrown out.

THE INVENTORS' INSTITUTE.

ESTABLISHED 1st MAY, 1862.

FORTNIGHTLY MEETINGS, DURING SESSION,

HELD (NOVEMBER TO MAY INCLUSIVE) AT

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London: Printed by EDWIN JOHN DAVEY, Boy Court, Ludgate Hill, E.C.; and Published for the Proprietors at 21, Cockspur Street, Charing Cross; and sold by W. KENT, Paternoster row, and SAMPSON LOW, SON, & MARSTON, English, American and Colonial Booksellers and Publishers Crown Buildings, 188, Fleet Street, London, E.C.